

Field Production

When a television production happens outside the studio, it is known as a **field production**. We normally distinguish among electronic news gathering that covers daily news events, electronic field production that deals with smaller scheduled events, and big remotes that are done for major events, such as sports, parades, and political conventions.

There are advantages to taking a production out of the studio and into the field:

- You can place or observe an event in its real setting or select a specific setting for a fictional event.
- You can choose from an unlimited number and a variety of highly realistic settings.
- You can use available light and background sounds so long as they accomplish your technical and aesthetic production requirements.
- You can save on production people and equipment because many EFP productions require less equipment and crew than similar studio productions (unless you do a complex EFP or a big remote).
- You avoid considerable rental costs for studio use and, if you work for a station, studio scheduling problems.

There are disadvantages as well:

- You do not have the production control the studio affords. Good lighting is often difficult to achieve in the field, in both indoor and outdoor locations, as is high-quality audio.
- On outdoor shoots the weather always presents a hazard. For example, rain or snow can cause serious delays simply because it is too wet or too cold to

shoot outside. A few clouds may give you considerable continuity problems when the preceding takes showed clear skies.

- You are always location-dependent, which means that some locations require the close cooperation of nonproduction people. For example, if you shoot on a busy downtown street, you will need the help of the police to control traffic and onlookers.
- When shooting on city, county, or federal property, you may need a permit from these agencies plus additional insurance stipulated by them.
- Field productions also normally require crew travel and lodging as well as equipment transportation.

As a television professional, you need to cope with these disadvantages. After all, you cannot squeeze a football field into a studio. With ENG and relatively simple EFP, the production efficiency of shooting in the field usually outweighs the lack of production control. Although ENG and EFP have been discussed throughout this book, the focus here is on their specific field production requirements.

▶ ELECTRONIC NEWS GATHERING

ENG production features and satellite uplink

▶ ELECTRONIC FIELD PRODUCTION

Preproduction; production preparation; production—equipment check; production—setup; production—rehearsals; production—video-recording; production—strike and equipment check; and postproduction

▶ BIG REMOTES

Remote survey, equipment setup and operation, director's duties, and floor manager and talent procedures

ELECTRONIC NEWS GATHERING

Electronic news gathering is the most flexible remote operation. As pointed out in previous chapters, one person with a camcorder can handle a complete ENG assignment. Even if the signal must be relayed back to the station or transmitter, ENG requires only a fraction of the equipment and the people of a big remote. Sometimes the shooter, or videographer (news camera operator), or even the VJ (video journalist) will also take care of the signal feed from the news vehicle to the station. With WiFi access, the video clips can be uploaded and sent to the station much like e-mail.

ENG Production Features

The major production features of ENG are the readiness with which you can respond to an event, the mobility possible in the coverage of an event, and the flexibility of ENG equipment and people. Because ENG equipment is compact and self-contained, you can get to an event and video-record or broadcast it faster than with any other type of television equipment. An important operational difference between ENG and EFP or big remotes is that ENG requires no standard preproduction. ENG systems are specifically designed for immediate response to a breaking story. In ENG you exercise no control over the event but merely observe it with your camcorder and microphone as best you can.

Even when working under extreme conditions and time restrictions, experienced VJs and shooters can quickly analyze an event, select its most important parts, and video-record pictures that edit together well. For important events the ENG team normally consists of two people—the videographer and the field reporter; but many ENG stories are covered by a single VJ or shooter and narrated later by the anchor during the newscast. ENG equipment can go wherever you go. It can operate in a car, an elevator, a helicopter, or a small kitchen. Your shoulder or arms usually substitute for a heavy tripod.

With ENG equipment you can either video-record an event or transmit it live. The transmission equipment has become so compact and flexible that a single camera operator can accomplish even a live transmission. Most ENG vehicles (usually vans) are equipped with a microwave transmitter, which, when extended, can establish a transmission link from the remote location to the station.

SEE 17.1 Some ENG camcorders have a transmitter attached for signal transmission over relatively short distances.

When doing a live transmission, you connect the camera cable to the microwave transmitter. You can also use such a microwave link to quickly transmit to the station the unedited video recording directly from the camcorder or the video recorder (VR) in the ENG van. With the proper equipment, you can also use video streaming to get your story broadcast. If all else fails and you are in WiFi-range, you can use Skype to report from the field.

Satellite Uplink

If high-quality video and audio are an issue and you cannot use a microwave link, you must request a satellite uplink van, which contains all the necessary uplink equipment. When used for news, the uplink van usually contains also one or two video recorders as well as editing equipment



17.1 ENG VAN WITH EXTENDED MICROWAVE TRANSMITTER

This regular-sized van houses the extendible microwave transmission device and a variety of recording and intercommunications equipment.

(often laptops). This way you can record your news footage while transmitting it live. **SEE 17.2**

Newspeople often prefer uplinking “hot” video recordings (those made moments before the transmission) to live transmission because it permits repeated transmission in case the satellite feed is temporarily interrupted or lost altogether. To further safeguard against signal loss, two video recorders are sometimes used for the recording and the playback of the same news story. If something goes wrong with one VR, you can quickly switch over to the next for the same material.

17.2 SATELLITE UPLINK VAN

The satellite news vehicle is a portable earth station. It sends television signals to the Ku-band satellites.



Gary Palminter

Such uplinks are pressed into service whenever big and especially newsworthy events are scheduled, such as a presidential election, a summit of heads of state, a high-profile criminal trial, or the world soccer finals. But the uplink truck is also used locally for the distribution of news stories, national and international teleconferencing, and whenever a signal cannot be sent readily by microwave or cable.

ELECTRONIC FIELD PRODUCTION

As you already know, EFP uses both ENG and studio techniques. From ENG it borrows its mobility and flexibility; from the studio it borrows its production care and quality control. The following discussion of some fundamental steps of preproduction, production, and postproduction in the field assumes that you are still functioning as the director, so you have to deal with production detail that is important for each member of the EFP team regardless of the specific jobs assigned. **ZVL1** PROCESS → Methods → location | studio

Preproduction

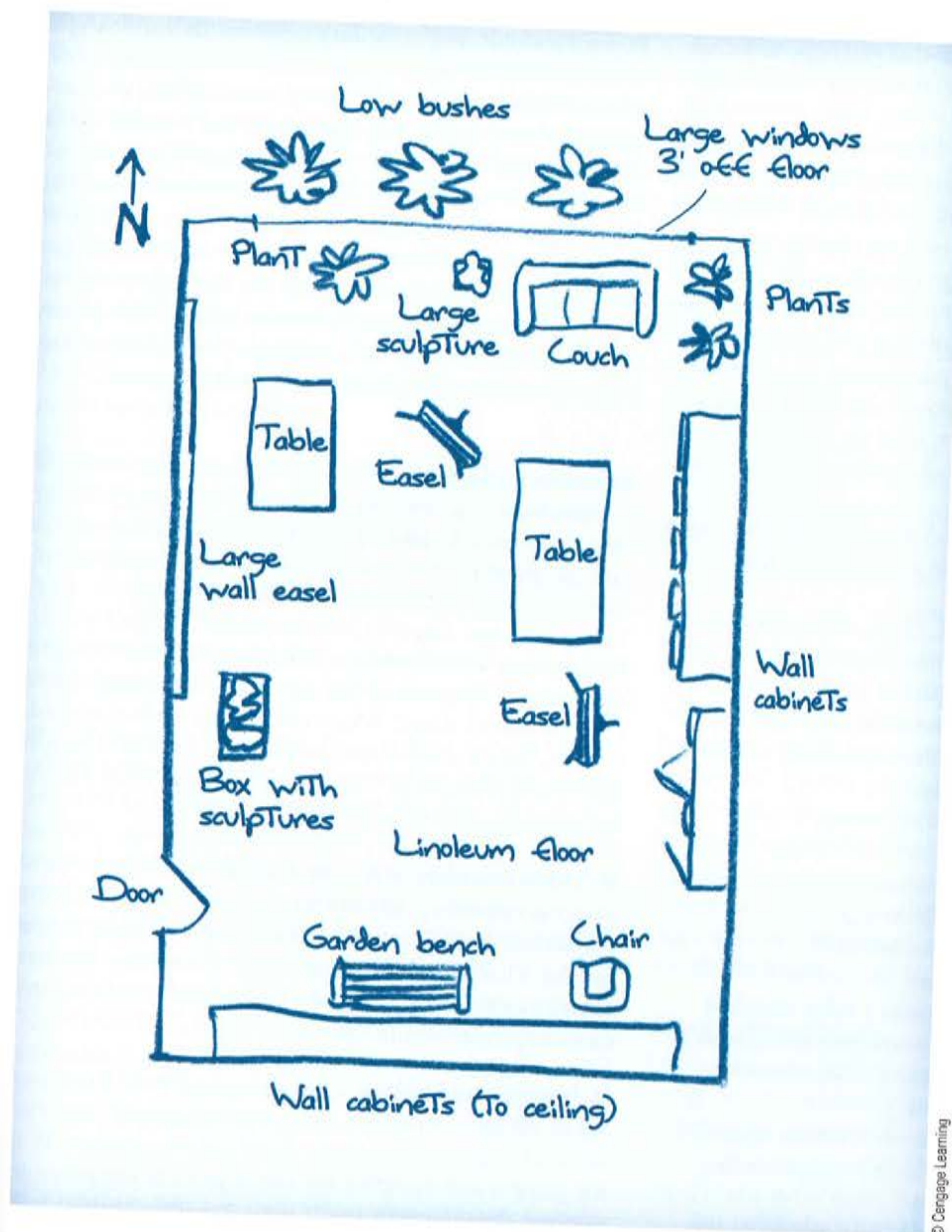
Compared with ENG, in which you simply respond to a situation, EFP requires careful planning. In general, the

preproduction steps are almost the same for EFP as for a studio production. As a first step, you need to define a workable process message, which you then need to translate into the most effective and efficient production method—whether to shoot it indoors or outdoors, single- or multicamera, in the normal sequence of events or film-style out of sequence.

Production Preparation

The preparation for the actual production starts with deciding on the medium requirements—the equipment and the people. Assuming that you have practiced this translation of process message into production requirements (see chapter 1), we jump to the production phase and the initial production steps: location survey, initial production meeting, and field production time line.

Location survey To get to know the environment in which the production will take place, make an accurate **location sketch**—a map of the locale of a remote telecast. For an indoor remote, the sketch shows the room dimensions and the furniture and window locations. For an outdoor remote, it indicates the location of buildings, the EFP vehicle, power sources, and the sun during the time of the telecast or recording.



17.3 INDOOR LOCATION SKETCH: ARTIST'S STUDIO

This location sketch of an artist's studio shows the basic dimensions and orientation and the doors, windows, and furnishings.

Take a look at the location sketch of an artist's studio. **SEE 17.3** This sketch gives important information about lighting and audio requirements, camera positions, and shooting sequences. Although technical preparations may not be your immediate concern, check on the availability of power (wall outlets), the acoustics (small room, reflective walls and floor, traffic noise from nearby freeway), and potential lighting problems (large windows).

If the production is literally in a field, are the most basic conveniences available? (Location surveys are

discussed further in the context of big remotes later in this chapter.)

Initial production meeting The initial production meeting ideally involves all key personnel, including the talent, PA (production assistant), the floor manager, and the DP (director of photography) or camera operator (who will also take care of the lighting). At a minimum you should meet with the talent, the PA (who may double as the audio/VR operator) and the camera operator. Explain

the defined process message and what you hope to accomplish. Distribute the location sketch and discuss the major production steps.

It is critical that everyone knows the exact location of the production and how to get there. Can everyone fit into the EFP van? Who is riding with whom? Who needs to come first to the station or production facility for equipment checkout, and who will go directly to the location? Who will drive the van? Hand out the time line and ask the PA to distribute it via e-mail to all other crewmembers who may not be at the meeting. As you can see, transportation to and from the location is an essential scheduling issue. If the field production is outdoors, what do you do in case of rain or snow? Always have an alternative time line ready.

Field production time line A shooting schedule for a fairly elaborate field production may look like this:

TIME LINE: FIELD PRODUCTION

7:30–8:15 a.m.	Equipment checkout
8:15 a.m.	Departure
9:15 a.m.	Estimated arrival time
9:30–10:00 a.m.	Production meeting with talent and crew
10:00–11:00 a.m.	Technical setup
11:00–11:30 a.m.	Lunch
11:30 a.m.–12:00 p.m.	Technical and talent walk-through
12:00–12:20 p.m.	Notes and reset
12:20–12:30 p.m.	Break
12:30–1:00 p.m.	Segment 1 video-recording
1:00–1:15 p.m.	Notes and reset for segment 2
1:15–1:45 p.m.	Segment 2 video-recording
1:45–1:55 p.m.	Break
1:55–2:10 p.m.	Notes and reset for segment 3
2:10–2:40 p.m.	Segment 3 video-recording
2:40–3:00 p.m.	Spill
3:00–3:30 p.m.	Strike
3:30 p.m.	Departure
4:30 p.m.	Estimated arrival time at station
4:30–4:45 p.m.	Equipment check-in

Not all time lines are as elaborate as this one. At a minimum you need to schedule the departure time, lunchtime and breaks, and the time of the return trip.

Production: Equipment Check

Again, apprise the crew of the schedule and the aim of the production. Go over the time line and the fact sheet of the

major locations and recording sessions. Be extracareful when loading the equipment. Unlike studio productions, where all the equipment is close at hand, in field productions you need to bring everything to the location. Even if you and the crew are involved in shooting an outdoor series, which requires for each EFP similar or identical equipment, use an equipment checklist before dashing off to the location. A wrong cable or adapter can cause undue delays or even the cancellation of the entire production.

Before loading equipment onto a vehicle, check each item to see that it works. At a minimum do a test recording of picture and sound before leaving for the location.

Equipment checklist The following equipment checklist is intended as a general guide and may not include all the items you need to take along. Depending on the relative complexity of the EFP, you may need considerably less or more than the items listed.

■ **Cameras or camcorders.** How many? Have they been checked out? Do you have the appropriate lens attachments (usually filters), if any? What camera mounts do you need: tripods, tripod dollies, special-purpose mounts? Do you have enough batteries? Are they fully charged? Do they fit the specific camcorders you use in the EFP?

■ **Video recorders and recording media.** If you use field cameras instead of camcorders, do they connect with the video recorders? Do you have the proper recording media for the VRs? Do you have enough? Check that the box actually contains the necessary media. Do all audio cables connect properly from camera to VR?

■ **Intercom and technical equipment.** If the EFP requires the simultaneous use of multiple cameras, do you have provisions for intercom and tally lights for the cameras? Will the camera and audio cables fit the jacks of the portable switcher (see figure 13.19)?

In case you do not have access to AC (alternating current) power, do you have batteries to drive all the equipment used? In critical (film-style) field productions for which you use a single high-quality camera, check with the technical supervisor about such additional equipment as an RCU (remote control unit) and test equipment to enable you to adjust the camera for optimal performance; a waveform monitor (oscilloscope) to help you adjust the brightness (keeping the white and black levels within tolerable limits); and a vector scope to help adjust the camera so that it produces true colors.

■ **Audio.** If you have not checked out the acoustics of the location, take several types of mics along. Check the wireless lavaliers. Do you have enough batteries for the wireless mic transmitters? Do the portable mics fit the channel frequency of the receiver? All remote mics, including the lavaliers, should have windscreens. Shotgun mics need additional wind jammers. Choose the most appropriate mounting equipment, such as clamps, stands, and fishpoles. Do you need a small field mixer? Does it work? If you use a separate audio recorder, check it out before taking it on-location. Do you need an XLR pad? Don't forget headsets for the fishpole operator and the audio-recording technician.

■ **Power supply.** Do you have the right batteries for the monitors, camcorders or field cameras, and audio equipment? Are they fully charged? If using AC power, do you have the right AC/DC (direct current) adapters? Do you have enough AC extension cords to reach the outlets? Unless they are battery-driven, you also need AC power and extension cords for the monitors. Take a few power strips along, but be careful not to overload any circuits.

■ **Cables and connectors.** Do you have enough camera cables, especially if there is a long run between the camera and the RCU or portable switcher? Are there enough coax and AC cables for monitor feeds? Always take a sufficient number of mic cables along, even if you plan to use wireless mics. The mic cables may save a whole production day if the wireless system breaks down or there is too much interference on-location. Do you have the right audio connectors for the mic cables and jacks (usually XLR connectors, but sometimes RCA phono)? Bring some adapters for video and audio cables (BNC to RCA phono, and XLR to RCA phono and vice versa). Although you should avoid adapters as much as possible, bring some along that fit the cables and a variety of input jacks, just for insurance.

■ **Lighting.** You can light most interiors with portable lighting instruments. Bring several lighting kits. Check that the kits actually contain the standard complement of lights, stands, and accessories. Do the lights work? Always pack a few spare lamps. Do the lamps actually fit the lighting instruments? Do they burn with the desired color temperature (3,200K or 5,600K)? Do you have enough reflectors (white foam core), umbrella reflectors, diffusion material (scrims, screens, diffusion gels), and color gels for regulating color temperature? The color gels most often needed are the amber or light-orange ones for lowering the color temperature and the light-blue ones for raising it.

Other important items to take along are: a light meter, light stands and clamps, sandbags to secure the portable light stands, some pieces of 1×3 lumber to construct a light bridge for back lights, a roll of aluminum foil for heat shields, extra barn doors, flags, and a dozen or so wooden clothespins to attach scrims or color gels to barn doors.

■ **Intercom.** If the single-camera EFP is taking place in a confined space, you don't need elaborate intercom systems; you can call your shots right from the production area. But if the event covers a large outdoor space, you need a small power megaphone and walkie-talkies and cell phones to communicate with the widely dispersed crew and the station, if necessary. If you use the portable switcher for a live or live-recorded multicamera pickup, such as for the high-school state championship basketball game, you need headsets and intercom (often regular audio) cables. Normally, portable switcher units have no intercom provisions.

■ **Miscellaneous.** There are a few more items that are often needed for a field production: extra scripts and time lines; field log sheets; slate and dry-erase markers; regular umbrellas (to protect the equipment from rain but also to shield the camera viewfinders from sunlight); "raincoats" (plastic covers) for cameras; white cards for white-balancing; a teleprompter (flat-panel display and laptop), if applicable; blank cue cards or a large newsprint pad and marker; an easel; and several rolls of gaffer's tape and masking tape. You also need white chalk, extra sandbags, wooden clothespins, rope, makeup kit, bottled water, towels, flashlights, trash bags, and a first-aid kit.

Production: Setup

Once everyone knows what is supposed to happen, the setup will be relatively smooth and free of confusion. Although as director you may not be responsible for the technical setup, you should watch carefully that the equipment is put in the right places.

For example, when shooting indoors, will the lights be out of camera range? Are they far enough away from combustible materials (especially curtains) and properly insulated (with aluminum foil, for example)? Are the back lights high enough so that they will be out of the shot? Is there a window in the background that might cause lighting problems? (The window in the artist's studio in figure 17.3 would certainly present a problem if you had to shoot the large sculpture.) Does the room look too cluttered? Too clean? Are there any audio problems you can foresee? If the talent wears a wired lavalier mic, does the mic cord restrict talent mobility? If you use a shotgun mic, can the fishpole

operator get close enough to the talent and, especially, move with the talent without stumbling over furniture? Are pictures hung where the camera can see them? Look behind the talent to see whether the background will cause any problems (such as lamps or plants seeming to extend from the talent's head).

When outdoors check for obvious obstacles that may be in the way of the camera, fishpole operators, and talent. Look past the shooting location to see whether the background fits the scene. Are there bushes, trees, or telephone poles that may, again, appear to extend from the talent's head? Large billboards are a constant background hazard. What are the potential audio hazards? Although the country road may be quiet now, will there be traffic at certain times? Are you near a police or fire station, where sirens might go off? Is there any air or train traffic near the location?

Production: Rehearsals

Most often rehearsals are limited to a quick walk-through. But you may need more rehearsals if the EFP requires the interaction of more than one or two people.

Walk-through Before you start with the actual rehearsal or video-recording, you should have a brief walk-through first with the crew and the talent to explain the major production points, such as camera positions, specific shots, and principal actions. Always follow the walk-through with the "notes" session, then have the crew take care of the remaining problems. Don't forget to give the talent and the crew a short break before starting with the rehearsal and recording sessions.

Rehearsal As pointed out earlier, single-camera field directing has its own rehearsal technique. Basically, you rehearse each take immediately before recording it. You walk the talent and the camera through the take, explaining what they should and should not do. If you use a fishpole for the audio pickup, include the fishpole operator in the walk-through. Record some of the critical scenes and watch and listen to the playback. You may want to adjust or change the mic or the mic position for a better pickup.

Production: Video-Recording

Just before the actual recording, ask the DP and/or the camera operator whether the camera is properly white-balanced for the scene location. Sometimes clouds or fog move in between the rehearsal and the actual recording, changing the color temperature of the light. Slate all takes

and have the PA or the VR operator record them on the field log.

Watch the background action as well as the main foreground action. For example, curious onlookers may suddenly appear out of nowhere and get in the shot, or the talent may stop her action exactly in line with a distant power pole that then appears to grow out of her head. Listen carefully to the various foreground and background sounds during the take. Do not interrupt the recording because there was a faint airplane noise. Most likely, such noise will get buried by the main dialogue or the additional sounds added in postproduction (such as music). But the noise of a police siren that interrupts a Civil War scene definitely calls for a retake.

At the end of each take, have the talent stand quietly and record a few seconds of additional material. This pad will be of great help to the editor in postproduction. Always record some usable cutaways as well as location sounds and room ambience for each location. Make the cutaways just a bit longer than you think necessary. The recorded "silence" will help bridge possible audio drops at edit points in postproduction.

When you feel that you have a series of good takes, play them back on the field monitor to see whether they are indeed acceptable for postproduction. If you detect gross problems, you can still do some retakes before moving on to the next scene or location. But watch the time line.

Production: Strike and Equipment Check

Have the location reset (furniture, curtains, and the like) the way you found it and the place cleaned before you leave. Pick up all scripts, shot sheets, and log sheets. Do not leave pieces of gaffer's tape stuck on floors, doors, or walls, and take away your trash. When loading the EFP vehicle, the floor manager, DP, or PA should run down the equipment checklist to see that everything is back in the vehicle before leaving or changing locations. Check that the source media are all properly labeled and—most importantly—loaded onto the vehicle. Some directors insist on carrying the source media personally.

Postproduction

EFP postproduction activities are, for all practical purposes, identical to those of single-camera studio productions: capturing the various takes on the hard drive of the editing computer, logging all takes on the source media, doing a rough-cut, and finally doing an on-line edit that is transferred to the final recording media—DVD, hard drive, or server (see chapter 18).

BIG REMOTES

A **big remote**, or simply remote, is done to televise the live or **live-recording** of large scheduled events that have not been staged specifically for television. Examples are sporting events, parades, and political gatherings. All big remotes use high-quality field cameras (studio cameras with high-zoom-ratio lenses) in key positions, a number of ENG/EFP cameras—as many as 20 or more for big events—and an extensive audio setup.

The cameras and the various audio elements are coordinated from a mobile control center—the **remote truck**. Remote trucks are usually powered by a portable generator, with a second one standing by in case the first one fails. If there is enough power available at the remote site, the truck is connected to the available power, with a single generator serving as backup.

The remote truck represents a compact studio control room and equipment room. It contains the following control centers.

- Audio control with a fairly large audio console, digital recording media, monitor speakers, and intercom systems
- Program control, also called production, with preview and line monitors, a switcher with special effects, a character generator (CG), and various intercom systems: PL (party line, private line, or phone line), P.A. (public address), and elaborate IFB (interruptible foldback or feedback) systems

- Video-recording control with several high-quality VRs or servers that can do regular recordings, do instant replays, and play slow-motion and freeze-frame video
- Video control with CCUs (camera control units), line monitors, patchboards, a generator, and sometimes signal transmission equipment **SEE 17.4 AND 17.5**

In very big remotes, one or more additional trailers may be used for supplemental production and control equipment, such as instant replay.

Because the telecast happens away from the studio, some production procedures are different from those for studio productions. We therefore examine the following production aspects specific to the field: remote survey, equipment setup and operation, director's duties, and floor manager and talent procedures.

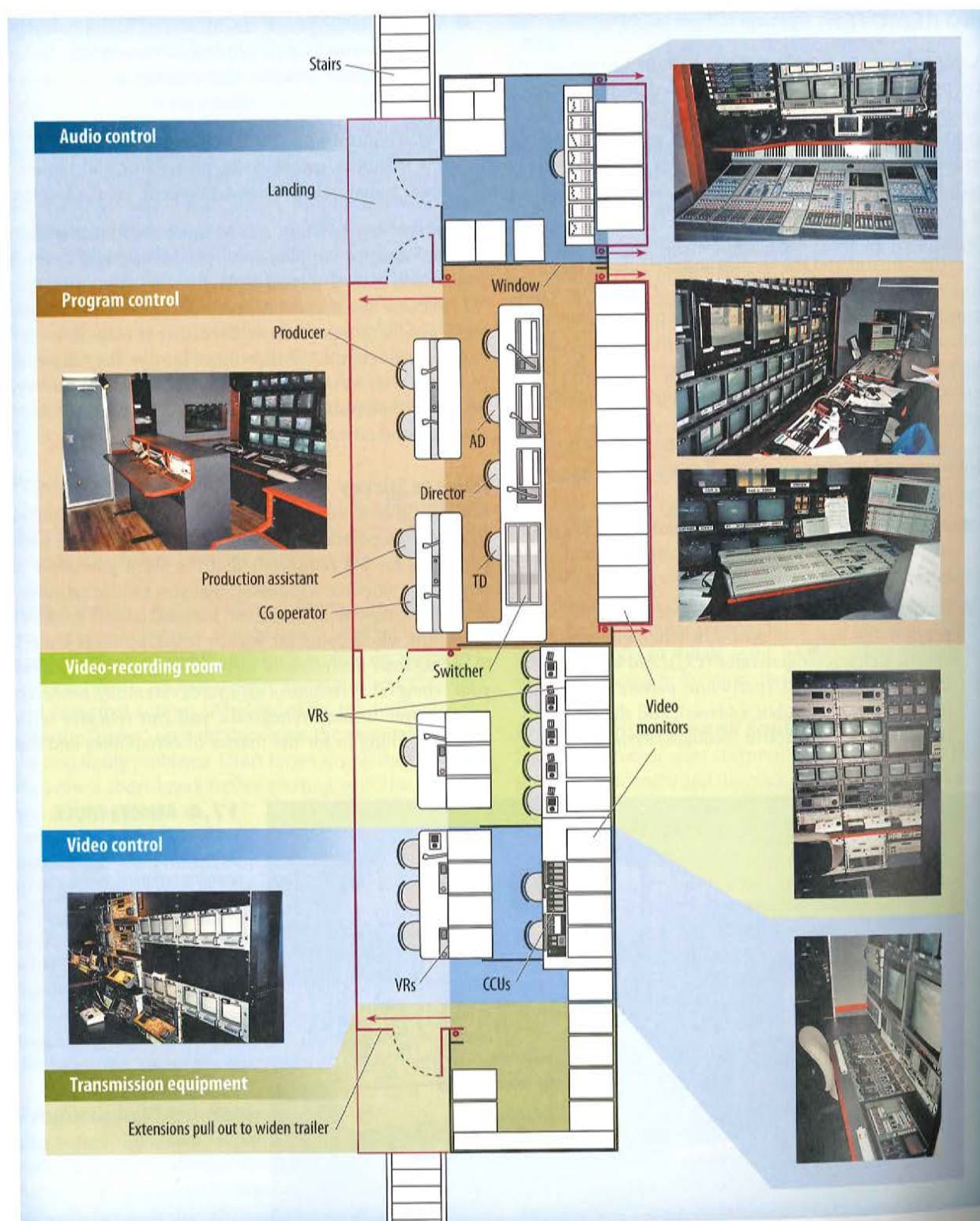
Remote Survey

Like any other scheduled production, a big remote requires thorough preparation—only more so. One problem with preparing for big remotes is that the event you cover is normally a onetime happening that you cannot rehearse. It would be ridiculous to ask two national hockey teams to repeat the whole game for you, or to ask political leaders to restate their lively debate verbatim just so you can have your rehearsal. A remote of an awards ceremony, however, allows some limited rehearsals; you can rehearse with stand-ins filling in for the master of ceremonies and the



17.4 REMOTE TRUCK

The remote truck is a complete control center on wheels. It contains program, audio, video, and technical control centers as well as CG and recording facilities.



17.5 CONTROL CENTERS IN REMOTE TRUCK

The remote truck carries the audio control, the program control, the video-recording and instant-replay control, the video control, and the transmission equipment.

awards nominees. Most sporting events (such as football, baseball, basketball, ice hockey, tennis, and so forth) have standard setups that don't change much, or at all, from one game to the next. Still, you have no control over the event itself but must follow it as best you can. Your production preparations must take these and several other such considerations into account. Yet another problem is that you can truck only the control room and the technical facilities to the site—not the studio itself. Cameras, microphones, and often lighting need to be brought to the remote location and made operational.

One of the key preparations is the remote survey. Many of the survey items for big remotes are equally applicable to other EFPs, such as an MTV segment or a visit to a manufacturing plant. As the name implies, a **remote survey**, or site survey, is an investigation of the location premises and the event circumstances. It should provide you with answers to some key questions about the nature of the event and the technical facilities necessary to televise it. Such surveys are obviously not necessary if you repeatedly do the same remote in the same location.

Contact person Your first concern is to talk to someone who knows about the event. This individual, called the contact person, or simply contact, may be the public relations officer of an institution or someone in a supervisory capacity. Call the contact to find out what he or she knows about the event and whether he or she can refer you to others who might answer your questions. In any case, get the contact's full name and position, business and e-mail addresses, and business, home, fax, and cell phone numbers. Then make an appointment for the actual remote survey.

The survey should ideally be conducted at the same time of day as the scheduled remote telecast because the location of the sun is extremely important for outdoor remotes as well as for indoor remotes where windows will be in the shots. Arrange to have the contact person with you during the production. Establish an alternative contact and copy him or her on information you send to the primary contact. Sometimes the contact person comes down with a cold on your production day.

Survey party The remote survey itself is concerned with production and technical considerations. The survey party therefore includes people from production and engineering. The minimum party usually comprises the remote's producer, director, and technical director (TD) or technical supervisor. Additional production and technical supervisory personnel, such as the production manager and the

chief engineer, may join the survey party, especially if the remote covers an important event and includes such elements as complex microwave or satellite links.

In general, the production requirements are first determined, then the technical people try to make the planned production procedures technically possible. Depending on the complexity of the telecast, extensive compromises must often be made by production people as well as by technical personnel.

As director you can make such compromises only if you know what the particular technical setup and pickup problems are and what changes in procedures will help overcome them. You should therefore familiarize yourself with the production as well as engineering requirements of television remotes. Although many production and technical survey questions overlap, for better clarification we consider them separately here.

Production survey The table on the following pages lists the key questions you should ask during the production survey. **SEE 17.6** A good location sketch can help you prepare for the production and anticipate major problems (see figures 17.16 and 17.17).

Technical survey The technical survey on page 384 lists only those items that directly influence the production procedures and, ultimately, your portion of the remote survey. **SEE 17.7** Technical points that have already been mentioned in the production survey, such as cameras and microphones, are not listed again.

Equipment Setup and Operation

There is no clear-cut formula for setting up equipment for a remote telecast. As with a studio production, the number of cameras, the type and the number of microphones, the lighting, and so forth depend entirely on the event. In almost all big remotes, the defined process message is simply to show the viewer the event as clearly as you can. A good director and remote team will also be able to convey not only what the event looks like but also how it feels—the relative intensity of the event.

Employing a great number of cameras, microphones, and other types of technical equipment does not necessarily guarantee a better telecast than when using less equipment. In fact, one or two camcorders are often more flexible and effective than a cumbersome remote truck with the fanciest VRs and audio-recording and switching gear. Even for multicamera EFPs, a portable switcher is usually easier to set up and operate than using large trucks. For

17.6 REMOTE SURVEY: PRODUCTION

These are the key questions you should ask during the production survey of a special event.

SURVEY ITEM	KEY QUESTIONS
Contact	Who are your principal and alternative contacts? Title; business and e-mail addresses; business, home, cell, and fax numbers.
Place	Where is the exact location of the telecast? Street address, telephone number. If you need traffic control, have the police been notified?
Time	When is the remote telecast? Date, time. What is the arrival time of the truck? Who is meeting you at the site for positioning the truck?
Nature of event	What is the exact nature of the event? Where does the action take place? What type of action do you expect? The contact person should be able to supply the necessary information.
Cameras (stationary)	How many cameras do you need? Use as few as possible. Where will you place the cameras? Do not place cameras on opposite sides of the action. In general, the closer together they are, the easier and less confusing the cutting will be. Shoot with the sun, not against it. Try to keep it behind or to the side of the cameras for the entire telecast. The press boxes of larger stadiums are generally located on the shadow side. If possible, survey the remote location during the exact time of the scheduled telecast. If it is not a sunny day, determine the position of the sun as closely as possible. Are there any large objects blocking the camera view, such as trees, telephone poles, or billboards? Will you have the same field of view during the actual telecast? A stadium crowd, for instance, may block the camera's field of view, although the view is unobstructed during the survey. Can you avoid large billboards in the background of shots, especially if the advertising competes with your sponsor's product? Do you need camera platforms? Where? How high? Can the platforms be erected at a particular point? Can you use the remote truck as a platform? If competing stations are also covering the event, have you obtained exclusive rights to your camera positions? Where do you want iso cameras positioned? Do you need umbrellas to shield viewfinders from the sun?
Cameras (mobile)	Do you need to move certain cameras? What kind of floor is there? Can the camera be moved on a field dolly, or do you need remote dollies (usually with large, inflatable rubber tires)? Will the dolly with the camera fit through narrow hallways and doors? Can you use ENG/EFP cameras instead of large studio/field cameras? What is their action radius? Can you connect them to a remote truck by cable (less chance of signal interference or signal loss), or do you have to send the signal back to the remote truck via microwave? If there are robotic cameras, where are they located? And do the remote controls work?
Lighting	Do you need additional lighting? Where and what kind? Can the instruments be hung conveniently, or do you need light stands? Do you need to make arrangements for back lights? Will the lights be high enough so that they are out of camera range? Do you have to shoot against windows? If so, can they be covered or filtered to block out undesirable daylight? Can you use reflectors?

17.6 REMOTE SURVEY: PRODUCTION *(continued)*

SURVEY ITEM	KEY QUESTIONS
Audio	What type of audio pickup do you need? Where do you need to place the mics? What is the exact action radius so far as audio is concerned? How long must the mic cables be? Which are stationary mics and which are handled by the talent? Do you need long-distance mics, such as shotgun or parabolic mics? Do you need wireless mics? Can their signals reach the wireless receivers? Do you need such audio arrangements as audio foldback or a speaker system that carries the program audio to the location? Can you tie into the "house" public address system? Do you need long-distance mics for sound pickups over a long range?
Intercommunications	What type of intercom system do you need? Do you have to string intercom lines? How many IFB channels and/or stations do you need and where do they go? Is there a need for a P.A. talkback system? In case cell phones do not work in this area, are there enough telephone lines available?
Miscellaneous production items	Do you need a clock? Where? Do you need line monitors, especially for the announcer? How many? Where should they be located? Will the announcer need a preview monitor to follow iso playbacks? Do you have a camera slate in case the CG cannot be used?
Permits and clearances	Have you (or the producer) secured clearances for the telecast from the police and fire departments? Do you have written clearances from the originators of the event? Do you have parking permits and assistance from security people for the remote truck and other production vehicles? Do you have passes and parking for all technical and production personnel, especially when the event requires entrance fees or has some kind of admission restrictions?
Other production aids	Does everyone have a fact sheet of the approximate order of events? These sheets are essential for the director, floor manager, and announcer and are extremely helpful to the camera operators, audio engineer, and additional floor personnel. Does the director have a spotter who can identify the major action and the people involved? In sports remotes, spotters are essential.

such big-remote operations as the live coverage of major sporting events, however, which may use many cameras in various positions, the remote truck provides essential equipment and production control.

Once set up, many of the production routines of big remotes do not differ significantly from studio productions. There are nevertheless some procedures in big-remote operations, such as instant replays, that you will not find in normal studio productions.

Director's Duties

For the following discussion of a onetime event, let's assume that you are functioning first as a director of a big remote, then as a floor manager, and finally as talent.

Directing the setup Because the actual on-the-air telecast of a big remote is usually live, the directing procedures bear little resemblance to the other field production methods; they more closely resemble live or live-recorded studio productions. The following setup procedures assume that the remote telecast is a special event. When directing routine remotes, such as a football game, the cameras are all in place and the crew, including the camera operators, are familiar with their assignments.

■ As soon as the remote truck is in position, conduct a thorough technical walk-through. Tell the technical staff where you want the stationary cameras located and what field of view you require (how close or wide a shot you

17.7 REMOTE SURVEY: TECHNICAL

The technical survey lists only those items that directly influence the production procedures.

SURVEY ITEM	KEY QUESTIONS
Power	Assuming you do not work from a battery pack or your own generator, is enough electricity available on-site? Where? Does the contact person have access to the power outlets? If not, who does? Make sure the contact is available during the remote setup and the actual production. Do you need extensions for the power cables? If you use a generator, do you have a second one for backup?
Location of remote truck and equipment	Where should the remote truck be located? Its proximity to the available power is critical if you do not have a power generator. Are you then close enough to the event location? Keep in mind that there is a maximum length for camera cables beyond which you will experience video loss. Watch for possible sources of video and audio signal interference, such as nearby X-ray machines, radar, or any other high-frequency electronic equipment. Does the remote truck block normal traffic? Does it interfere with the event itself? Reserve parking for the truck. Have you asked the police for assistance?
Recording devices	If the program is recorded, do you have the necessary video recorders in the truck? Do you need additional VRs for instant replays? If you have to feed the audio and video signals back to the station separately, are the necessary phone lines cleared for the audio feed? Do you have enough media to record the full event? Have you made provisions for switching media without losing part of the event? Are the iso cameras properly patched into the switcher and into separate VRs?
Signal transmission	If the event is fed back to the station for video-recording or directly to the transmitter for live broadcasting, do you have a good microwave or satellite uplink location? Do you need microwave mini-links? Double-check on the requirements for feeding the satellite uplink.
Cable routing	How many camera cables do you need? Where do they have to go? How many audio cables do you need? Where do they have to go? How many intercom lines do you need? Where do they have to go? How many AC power lines do you need? Where do they go? Route the cables in the shortest possible distance from remote truck to pickup point, but do not block heavily traveled hallways, doors, walkways, and so on. Do the cables have to cover a great span? If so, string a rope and tie the cable to it to relieve the tension.
Lighting	Are there enough AC outlets for all lighting instruments? Are the outlets fused for the lamps? Do not overload ordinary household circuits (usually 15 amps). Do you have enough extension cords and power strips (or simple multiple wall plugs) to accommodate all lighting instruments and the power supply for monitors and electric clocks?
Communication systems	What are the specific communication requirements? PLs? IFB channels? Telephone lines? Cell phones? P.A. systems? Long-range walkie-talkies? Two-way radios?

need to get with each camera). Get the cameras as close to the action as possible to avoid overly narrow-angle zoom lens positions. Apprise the crew of the approximate moves and ranges of mobile cameras and what audio needs you have. Unless they will be in a booth, specify where the announcers are going to be so that their monitors, mics, and intercom can be properly routed.

- While the technical crew is setting up, hold a production meeting with the contact person, the producer, the AD (associate director), the floor manager, the PA, the talent, and, if not directly involved in the setup, the TD or technical supervisor. Have the contact describe the anticipated event. Explain how you intend to cover it. Although it is the producer's job to alert the talent to the prominent features of the event, such as a prize-winning float in the parade, be prepared to take over in case the producer is sidetracked by some other problem. Delegate the setup supervision to the AD, floor manager, and TD. Do not try to do everything yourself.
- Pay attention to all communication systems, especially the intercom. During the telecast you will have no chance to run in and out of the remote truck to the actual site; all of your instructions will come via voice communication from the truck. Discuss the coverage of the event in detail with the floor manager, who holds one of the most critical production positions during a remote.
- Usually, you as director have no control over the event itself; you merely try to observe it as faithfully as possible. Once again, check with the contact person and the announcer on the accuracy of the fact sheet and the specific information concerning the event. Ask the talent to double-check on the pronunciation of the names of places and participants.
- Walk through the site again and visualize the event from the cameras' perspectives. Are they in the optimal shooting positions? Are they all on one side of the principal vector line so that you will not reverse the action on-screen when cutting from one to another? If shooting outdoors, will any of the cameras be blinded by the sun? Will the sun be directly behind the cameras (which, in effect, will wash out the viewfinder images)? Experienced camera operators will use an umbrella or flags attached to the camera to prevent the sun from washing out their viewfinders.
- Keep in mind that you are a guest while covering a remote event. Unless television is an integral part of the event, such as in most sports, try to work as quickly and

as unobtrusively as possible. Do not make a big spectacle of your production. Realize that you are basically intruding on the event and that the people involved are usually under some stress.

Directing the on-the-air telecast Once you are on the air, try to keep on top of the event as well as possible. If you have a good spotter (the contact person, event expert, or AD), you will be able to anticipate certain happenings and be ready for them with the cameras. The following are some general points to remember.

- Speak loudly and clearly. Usually, the site is noisy and the camera operators and the floor crew may not hear you very well. Put your headset mic close to your mouth. Yell if you have to, but do not get frantic. Tell the crewmembers to switch off their headset talkbacks to prevent the ambient sound from entering the intercom system.
 - Listen to the floor manager and the camera operators. They may help spot event details and report them to you as they occur.
 - Watch the monitors carefully. Often the off-air cameras get especially interesting shots, but do not be tempted by cute yet meaningless or even event-distorting shots. If, for example, the great majority of an audience listens attentively to the orchestra, do not single out the one person who is conducting or asleep in the back row, as colorful a shot as this may be.
 - Listen to the audio. A good announcer will give you clues as to the development of the event and sometimes direct your attention to a significant event detail.
 - If things go wrong, stay calm. For example, if a spectator blocks the key camera or if the camera operator swish-pans to another scene because he thinks his camera is off the air, don't scream at the floor manager to "get this jerk out of the way" or at the camera operator that he is still "hot." Simply cut to another camera.
 - Exercise propriety and good taste in what you show the audience. Avoid capitalizing on accidents (especially during sporting events) or situations that are potentially embarrassing to the person on-camera, even if such things might appear hilarious to you and the crew at the moment.
- Instant replay** In an *instant replay*, a key play or event segment is repeated for the viewer. Instant-replay operations usually use *iso cameras*, which feed into the switcher

as well as into their own separate video recorders. Some large sports remotes employ a second, separate switcher that is dedicated exclusively to inserting instant replays.

During the replay digital video effects (DVE) are often used to explain a particular play. The screen may be divided into several squeezed boxes or corner wipes, each displaying a different aspect of the play; or it may function as an electronic blackboard that shows simple line drawings over the freeze-frame of an instant replay, very much like the sketches on a traditional blackboard. Game and player statistics are displayed using the CG. Some of the information is preprogrammed and stored on disk, but up-to-date statistics are continuously entered by a CG operator. The whole instant-replay and CG operation is usually guided by the producer or AD. The director is generally much too occupied with the real-time coverage to worry about instant replays and special effects.

When watching an instant replay of a key action, you may notice that the replay either duplicates exactly the sequence you have just seen or, more frequently, shows the action from a slightly different perspective. In the first case, the picture sequence of the regular game coverage—that is, the line output—has been recorded and played back; in the second case, it is the pickup of an iso camera that has been recorded and played back.

In sports the principal function of the iso cameras is to follow key plays or players for instant replay. Iso cameras are also used in remote productions such as rock concerts or orchestra performances with a multicamera setup. When covering an orchestra, you may want to have an iso camera on the conductor at all times, which provides a convenient cutaway in postproduction.

When a remote production is done for postproduction rather than live, all cameras may be used in iso positions, with each camera's output recorded by a separate VR. The output of all iso cameras is then used as source material for extensive postproduction editing.

Postshow activities The remote is not finished until all the equipment is struck and the site is restored to its original condition. As a director of big remotes, you should pay particular attention to the following postshow procedures.

- If something went wrong, do not storm out of the remote truck, accusing everyone, except yourself, of making mistakes. Cool off first, then find out how the mistake occurred so that you can avoid it in the future.
- Thank the crew and the talent for their efforts. Nobody ever wants a remote to look bad. Especially thank the

contact person and others responsible for making the event and the remote telecast possible. Leave as good an impression of you and your team as you can. Remember that when you are at a remote location, you are representing your company and, in a way, the whole of "the media."

- Thank the police for their cooperation in reserving parking spaces for the remote vehicles, controlling the spectators, and so forth. You may need them again for your next remote telecast. See to it that the floor manager returns all the production equipment to the station.

Floor Manager and Talent Procedures

As the floor manager, you play a key role in big remotes. The "floor" activities you have to manage have increased considerably in size and complexity.

Floor manager's procedures As a floor manager (also called stage manager or unit manager on big remotes), you have, next to the director and the TD, the major responsibility for the success of the remote telecast. Because you are close to the scene, you often have a better overview of the event than does the director, who is isolated in the remote truck. The following points will help you make the big-remote production a successful one.

- Familiarize yourself with the event ahead of time. Find out where it is taking place, how it will develop, and where the cameras and the microphones are positioned relative to the remote truck. Make a sketch of the major event developments and the equipment setup (see section 17.2).
- Triple-check all intercom systems. Find out whether you can hear the instructions from the remote truck and if you can be heard there. Check that the intercom is working properly for the other floor personnel. Check all wireless headsets, IFB channels, walkie-talkies, cell-phone connections, and any other field communication devices.
- Be aware of the traffic in the production area. Try to keep onlookers away from the equipment and the action areas. Be polite but firm. Work around the crews from other stations. Be especially aware of reporters from other media. It would not be the first time that a news photographer snapping pictures just happens to stand right in front of your key camera. Appeal to the photographer's sense of responsibility: say that you too have a job to do in trying to inform the public.
- If the telecast is to be video-recorded, have the slate ready, unless the CG is used for slating.

- Check that all cables are properly secured to minimize potential hazards to the people in the production area. If it has not been done by the technical crew, tape cables to the floor or sidewalk and put a mat over the cables at major pedestrian traffic areas.
 - Introduce yourself to the police officers assigned to the remote and fill them in on the major event details. Introduce them to the talent. The police are generally more cooperative and helpful when they get to meet on-the-air personalities and feel that they are part of the remote operation.
 - Help the camera operators with spotting key event details. Discuss with the cable pullers (floor personnel) the action radius of the portable cameras. These people are often the key to getting good shots with a portable EFP camera or a camcorder that is also attached to an RCU.
 - Relay all director's cues immediately and precisely. Position yourself so that the talent see the cues without having to look for you. (Most of the time, talent are hooked up to the IFB via earphones, so the director can cue them without the floor manager as an intermediary.)
 - Have several 3 × 5 cards handy so you can write cues and pass them to the talent, just in case you lose the IFB channel.
 - When the talent are temporarily off the air, keep them informed about what is going on. Help keep their appearance intact for the next on-the-air performance and offer encouragement and positive suggestions.
 - After the telecast pick up all the production equipment for which you are directly responsible—easels, platforms, sandbags, slates, and headsets. Double-check whether you have forgotten anything before you leave the remote site. Make use of the director's or TD's equipment checklist.
- Talent procedures** The general talent procedures (as discussed in chapter 15) also apply to remote operations, but there are some points that are especially pertinent to you as talent.
- Familiarize yourself thoroughly with the event and your specific assignment. Know the defined process message and do your part to effect it. Review the event with the producer, director, and contact person.
 - Test your microphone and your intercom system. If you work with an IFB system, check it out with the director or producer.
 - Verify that your monitor is working. Ask the floor manager to have the TD punch up the line-out picture as soon as the cameras are uncapped. Ask for at least color bars to be put on-line.
 - If you have the help of a contact person or a spotter to identify the players in a particular event, discuss again the major aspects of the event and the communication system between the two of you once you are on the air. For example, how is the spotter going to tell you what is going on while the microphone is hot?
 - Verify the pronunciation of names and places. Little is more embarrassing for all involved than when names of locally well-known people are mispronounced by the television commentators.
 - When you are on the air, tell the audience what they cannot see for themselves. Do not report the obvious. For example, if you see the celebrity stepping out of the airplane and shaking hands with the people on the tarmac, do not say, "The celebrity is shaking hands with some people"; tell who is shaking hands with whom. If a football player lies on the field and cannot get up, do not tell the audience that the player apparently got hurt—they can see that for themselves; tell them who the player is and what might have caused the injury. Also, follow up this announcement periodically with more detailed information about the injury and how the player is doing.
 - Do not get so involved in the event that you lose your objectivity. On the other hand, do not remain so detached that you appear to be uninterested or to have no feelings whatsoever.
 - If you make a mistake in identifying someone or something, admit it and correct it as soon as possible.
 - Do not identify event details solely by color, as colors are often distorted on home receivers. For instance, refer to the runner not only as the one in the red trunks but also as the one on the left side of the screen.
 - As much as possible, let the event itself do the talking. Keep quiet during extremely tense moments. For example, do not talk during the intense pause between the "Get set" command and the firing of the starter's pistol in the 100-meter track finals.¹

1. For a more detailed description of sports reporting, see Stuart W. Hyde, *Television and Radio Announcing*, 11th ed. (Boston: Allyn and Bacon, 2009), pp. 285–308.

MAIN POINTS

- ▶ The three types of remotes are ENG (electronic news gathering), EFP (electronic field production), and big remotes.
- ▶ ENG is the most flexible remote operation. It offers speed in responding to an event, maximum mobility while on-location, and flexibility in transmitting the event live or in live-recording it with camcorders for immediate transmission by the station or for postproduction editing.
- ▶ Unlike ENG, which has little or no preparation time for covering a breaking story, EFP must be carefully planned. In this respect it is similar to big remotes.
- ▶ EFP is normally done with an event that can be interrupted and restaged for video-recording various event segments. It is most often done with a single camera or sometimes with multiple iso (isolated) cameras that shoot an event simultaneously.
- ▶ A big remote televises live, or live-records, a large scheduled event that has not been staged specifically for television, such as a sporting event, parade, political gathering, or congressional hearing.
- ▶ All big remotes use high-quality cameras in key positions and ENG/EFP cameras for mobile coverage. Big remotes usually require extensive audio setups.
- ▶ Big remotes are coordinated from the remote truck, which contains an audio control, a program control, video-recording and instant-replay control, and a technical control with CCUs (camera control units) and transmission equipment.
- ▶ Big remotes require extensive production and technical surveys as part of the production activities.
- ▶ In sports remotes instant replay is one of the more complicated production procedures. It is normally handled by an instant-replay producer or an AD (associate director).

Covering Major Events

As you know by now, EFP and especially big remotes require meticulous planning. Such careful preparation is particularly important for onetime happenings, such as sporting events that are not routinely televised, a rock concert, or a political convention. No two remotes are exactly the same, and there are always unique circumstances that require adjustments and compromises. This section includes some simple setups for sports remotes, how to read location sketches and some examples of typical indoor and outdoor remote setups, and an overview of field communication systems and signal transport.

▶ SPORTS REMOTES

Pickup requirements for baseball, football, soccer, basketball, ice hockey, tennis, boxing or wrestling, and swimming

▶ LOCATION SKETCH AND REMOTE SETUPS

Reading location sketches, and production requirements for public hearing (indoor remote) and parade (outdoor remote)

▶ COMMUNICATION SYSTEMS

Communication systems for ENG, EFP, and big remotes

▶ SIGNAL TRANSPORT

Microwave transmission, cable distribution, cloud broadcasting, and communications satellites

SPORTS REMOTES

Many big remotes are devoted to the coverage of sporting events. The number of cameras used and their functions depend almost entirely on who is doing the remote.

Networks use a great amount of equipment and many personnel for the average sports remote. For especially important games, such as the Super Bowl or World Cup soccer, a crew of 100 or so people set up and operate 30

or more field cameras; additional robotic cameras, some of which run on cables stretched along the field; countless mics; multiple monitors; and intercom and signal-distribution systems. There may be several large trailers that house the control room and the production equipment, and two or three satellite uplink trucks.

For the coverage of a local high-school game, however, you must get by with far less equipment. You may have only two cameras and three mics to do the pickup. Local stations or smaller production companies usually supply only the key production and technical personnel (producer, director, AD, PA, floor manager, TD, engineering supervisor, and audio technician) and hire a remote service that includes a remote truck, all equipment, and, on request, extra technical personnel.

The following figures illustrate the minimum video and audio pickup requirements for baseball, football, soccer, basketball, ice hockey, tennis, boxing or wrestling, and swimming. **SEE 17.8–17.15** Sometimes ENG/EFP cameras are used in place of the larger high-quality studio/field cameras or are added to the minimal setups described here.²

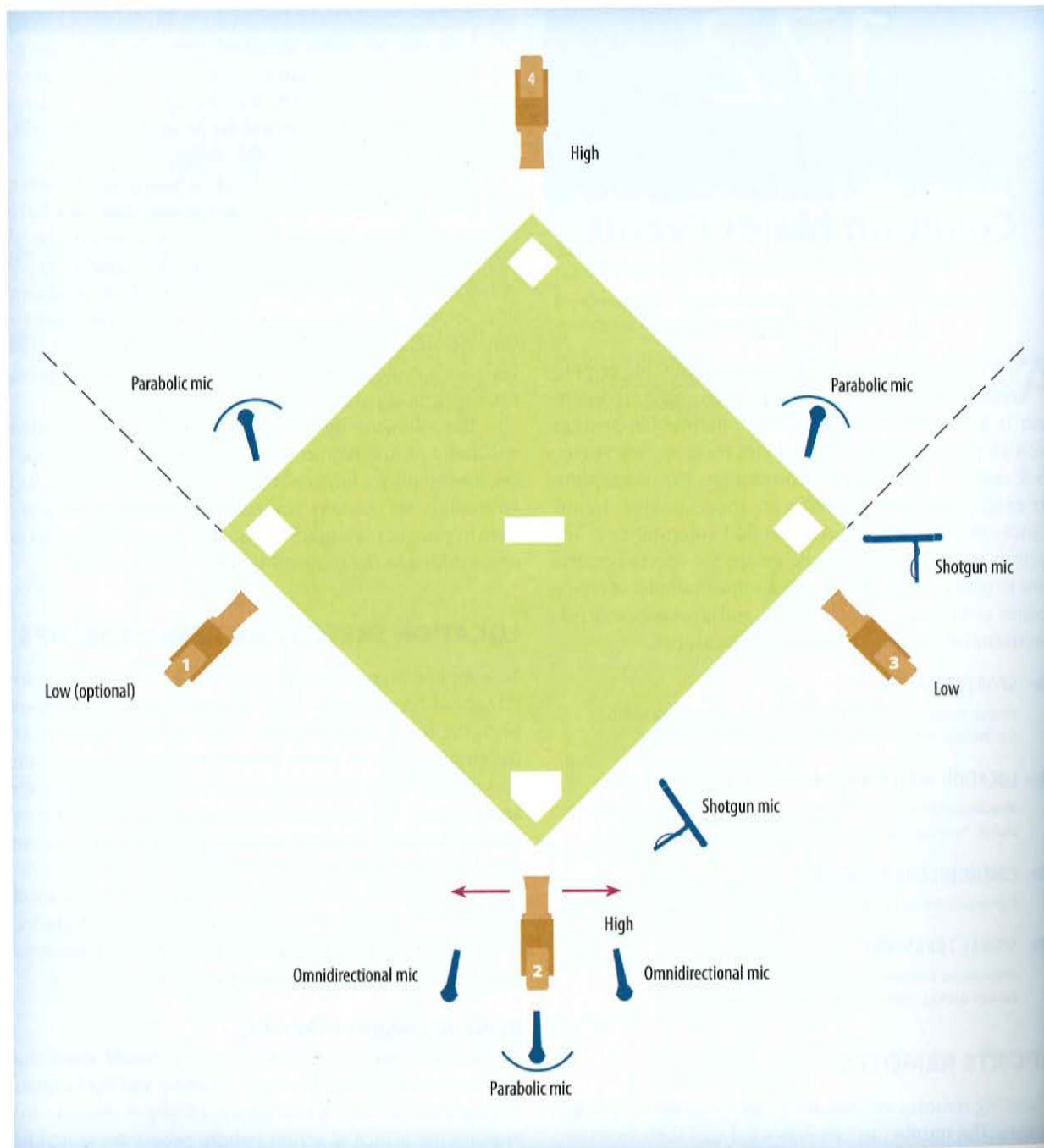
LOCATION SKETCH AND REMOTE SETUPS

To simplify preproduction you as the director, or your AD, should prepare a location sketch. Like the studio floor plan, the location sketch shows the principal features of the environment in which the event takes place (stadium and playing field, street and major buildings, or hallways and rooms). The location sketch will help you decide on the placement of cameras, it will help the audio technician decide on the type and the possible location of microphones, and it will give the TD some idea about the location of the remote truck and the cable runs. Finally, if indoors, it will help the LD (lighting director) determine the type and the placement of lighting instruments.

Reading Location Sketches

The location sketch for indoor events should show the general dimensions of the room or hallway and the location of windows, doors, and furniture. Ideally, it should also indicate the principal action (where people are seated or where they will be walking) and such details as power outlets; actual width of especially narrow hallways, doors, and

2. For detailed miking setups of multiple sporting events, see Stanley R. Alten, *Audio in Media*, 10th ed. (Boston: Wadsworth, 2014), pp. 288–305.



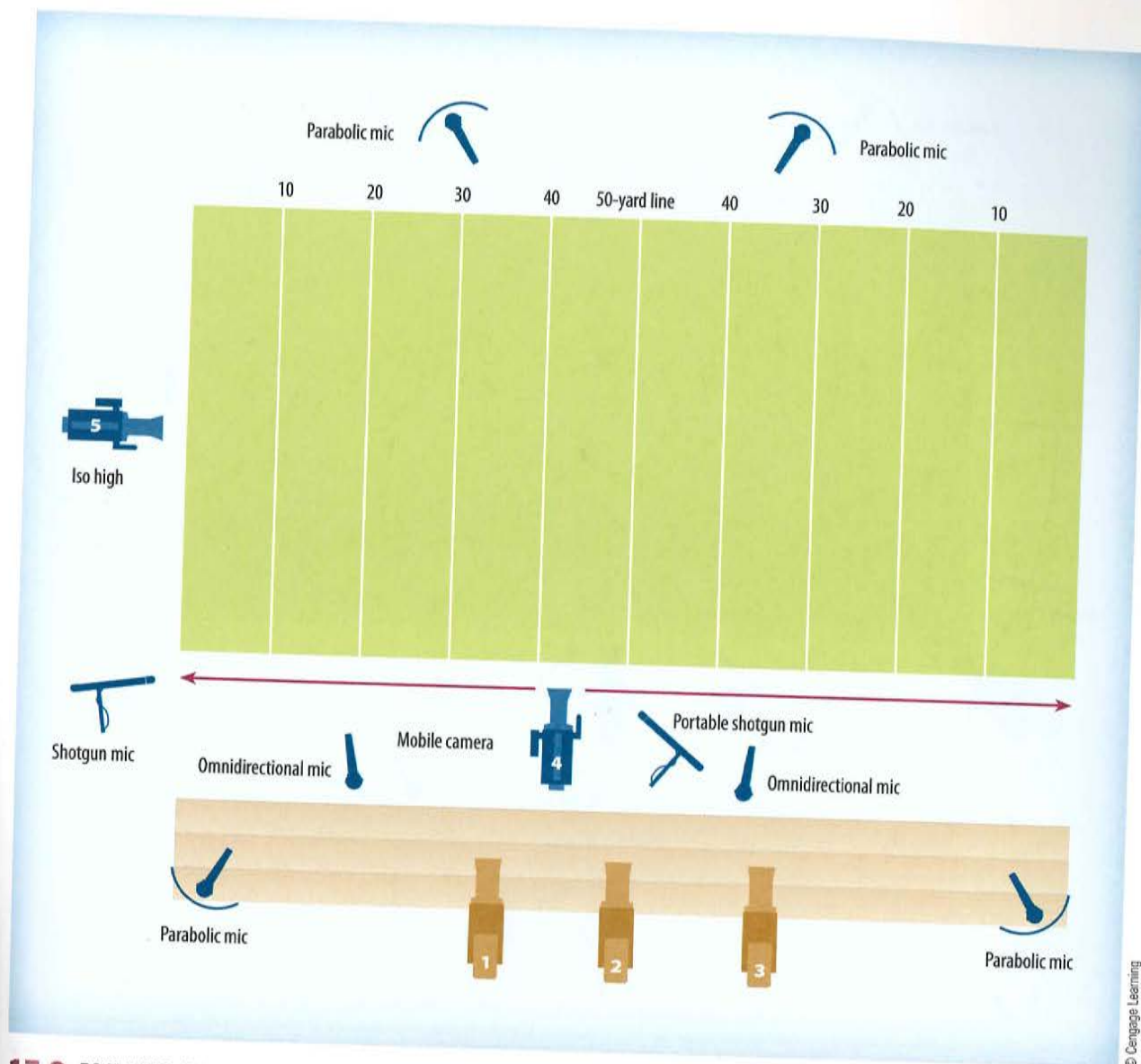
17.8 BASEBALL SETUP

Number of cameras: 3 or 4

- C1: Near third base; low, optional
- C2: Behind home plate; high
- C3: Near first base; low; watch for action reversal when intercutting with C1
- C4: Opposite C2 in center field; high; watch for action reversal

Number of mics: 6 or 7

- 2 omnidirectional mics high in stands for audience
- 2 shotgun mics or a parabolic (mobile) mic behind home plate for game sounds
- 2 or 3 parabolic mics for field and audience sounds



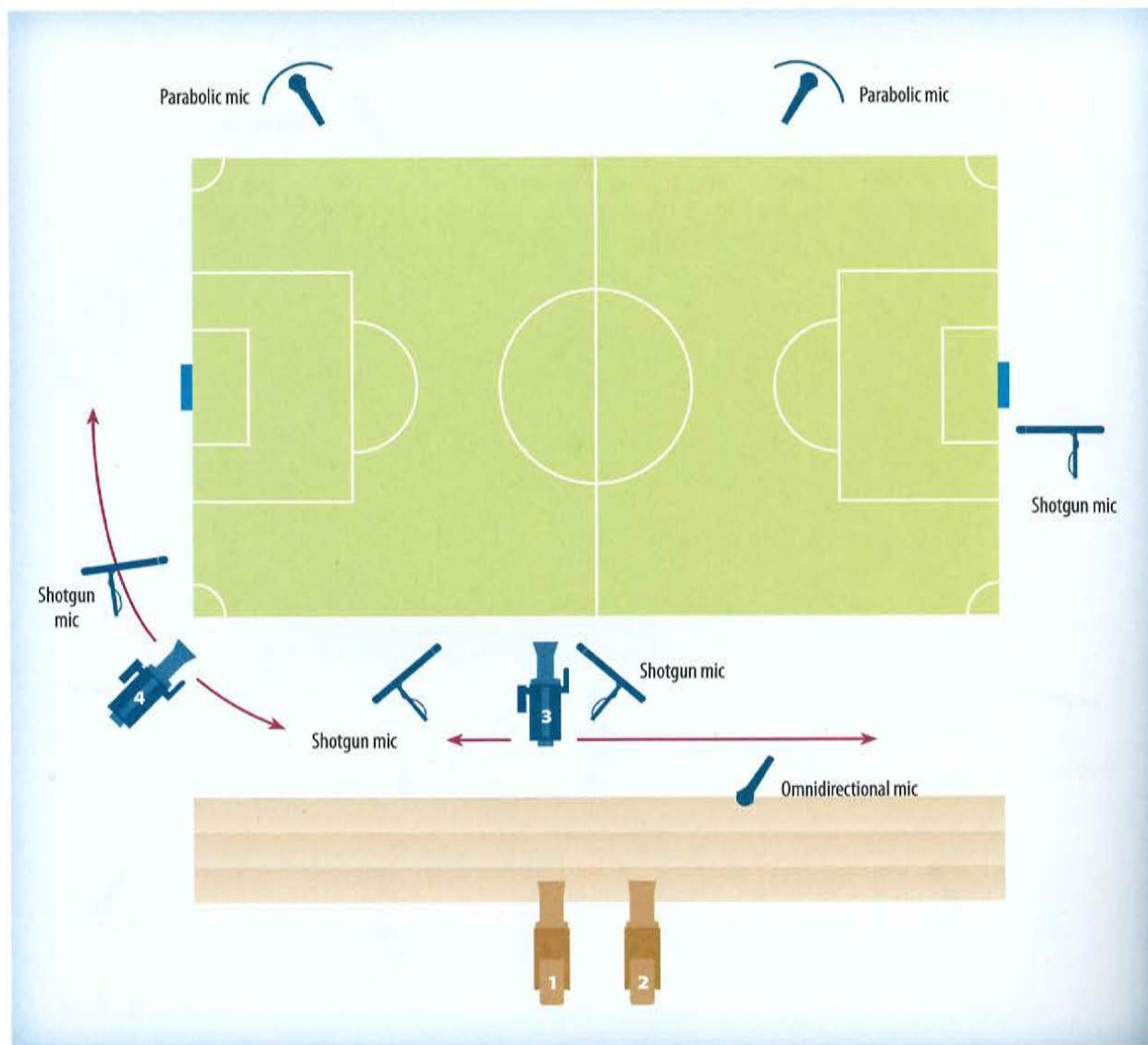
17.9 FOOTBALL SETUP

Number of cameras: 4 or 5

- C1, C2, C3: High in the stands, near the 35-, 50-, and 35-yard lines (press box, shadow side)
- C4: Portable or on dolly in field
- C5: Optional iso camera behind goal (portable ENG/EFP or big camera)

Number of mics: 8

- 2 omnidirectional mics in stands for audience
- 2 shotgun or parabolic mics on field
- 2 parabolic reflector mics in stands and 2 on opposite side of field



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17.10 SOCCER SETUP

Number of cameras: 3 or 4

C1: Left of centerline (high)

C2: Right of centerline (high)

C3: Mobile on field

C4: Optional, left corner; may be used as iso camera and mobile camera on field

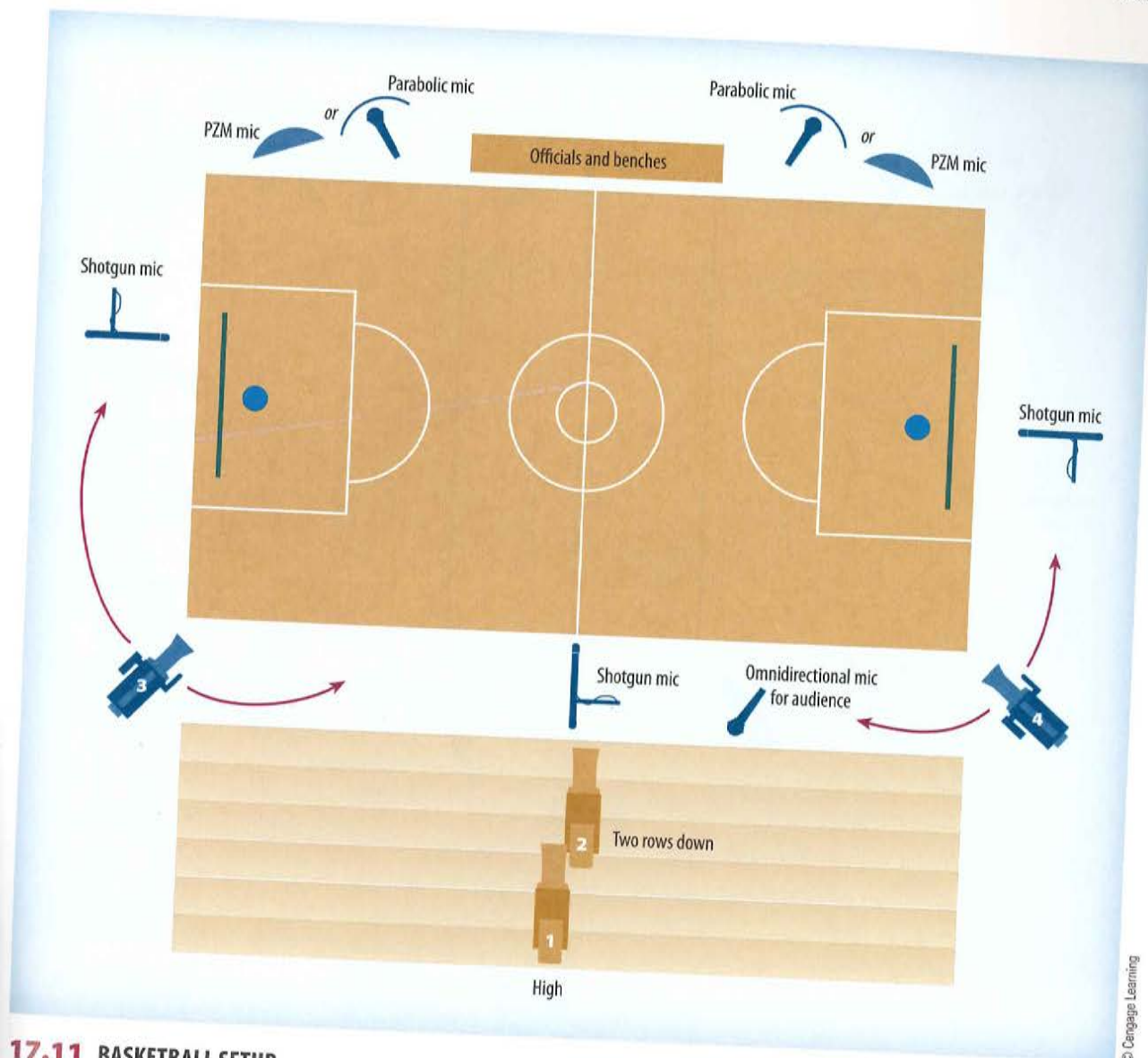
All four cameras are on shadow side of field.

Number of mics: 7

1 omnidirectional mic in stands for audience

4 shotgun mics on field

2 parabolic mics on opposite side of field



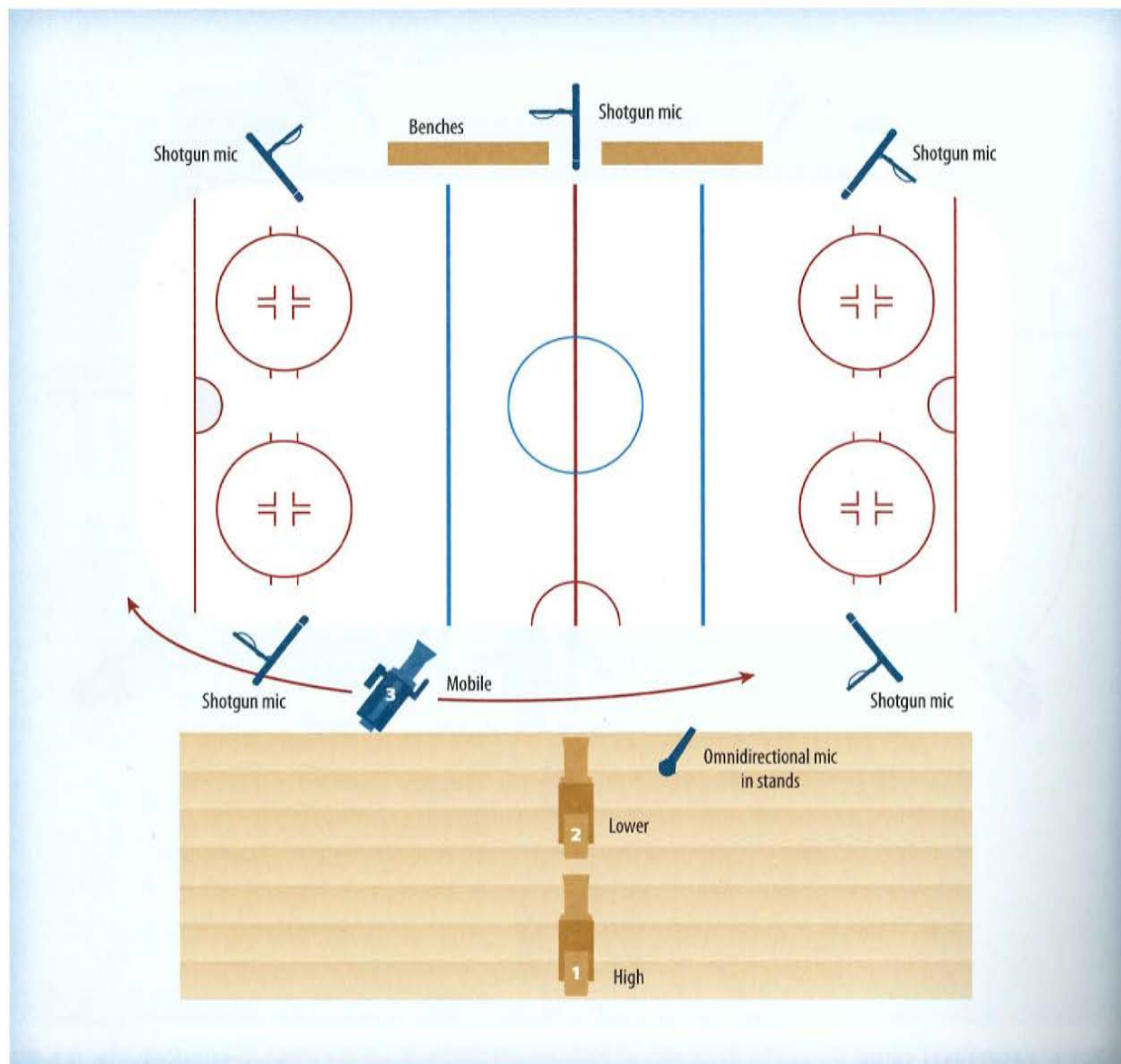
17.11 BASKETBALL SETUP

Number of cameras: 4

- C1: High in stands, left of centerline—follows game
- C2: Lower (2 rows down) in stands, right of centerline (fairly close to C1)—gets close-ups
- C3: In left corner (mobile)
- C4: In right corner (mobile)

Number of mics: 6

- 1 omnidirectional mic in stands for audience
- 2 PZM or parabolic mics in stands for audience
- 2 shotgun mics behind each basket for game sounds
- 1 shotgun mic at center court



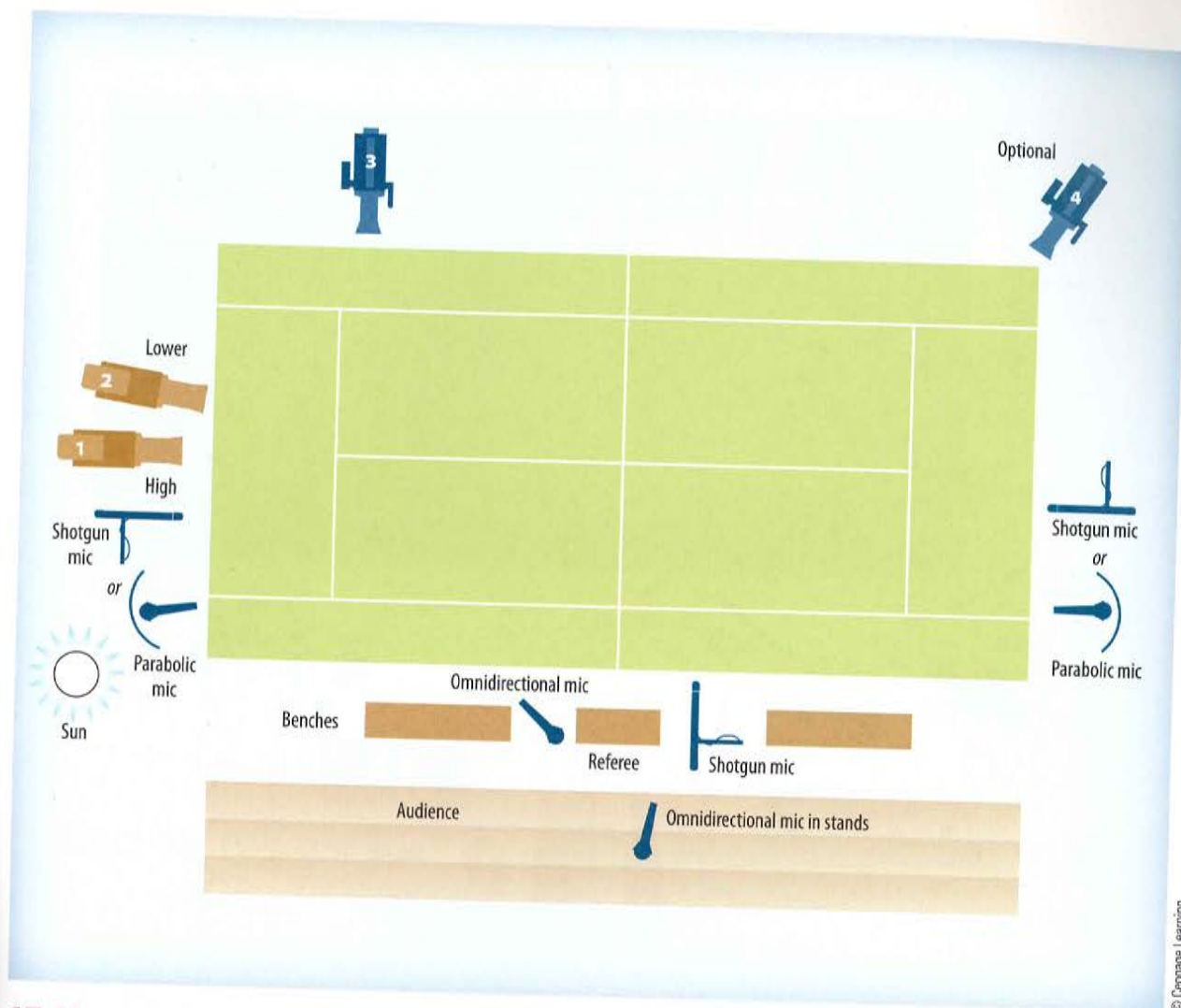
17.12 ICE HOCKEY SETUP

Number of cameras: 3

- C1: High in stands at centerline (red). Carries most of the game in long shots or medium shots.
- C2: Lower in stands below C1 at centerline for close-ups of game and players' benches
- C3: Portable camera that can look over the boards and the glass for various action shots

Number of mics: 6

- 1 omnidirectional mic in stands for audience
- 4 shotgun mics at each corner, pointing inward
- 1 shotgun mic at centerline between benches



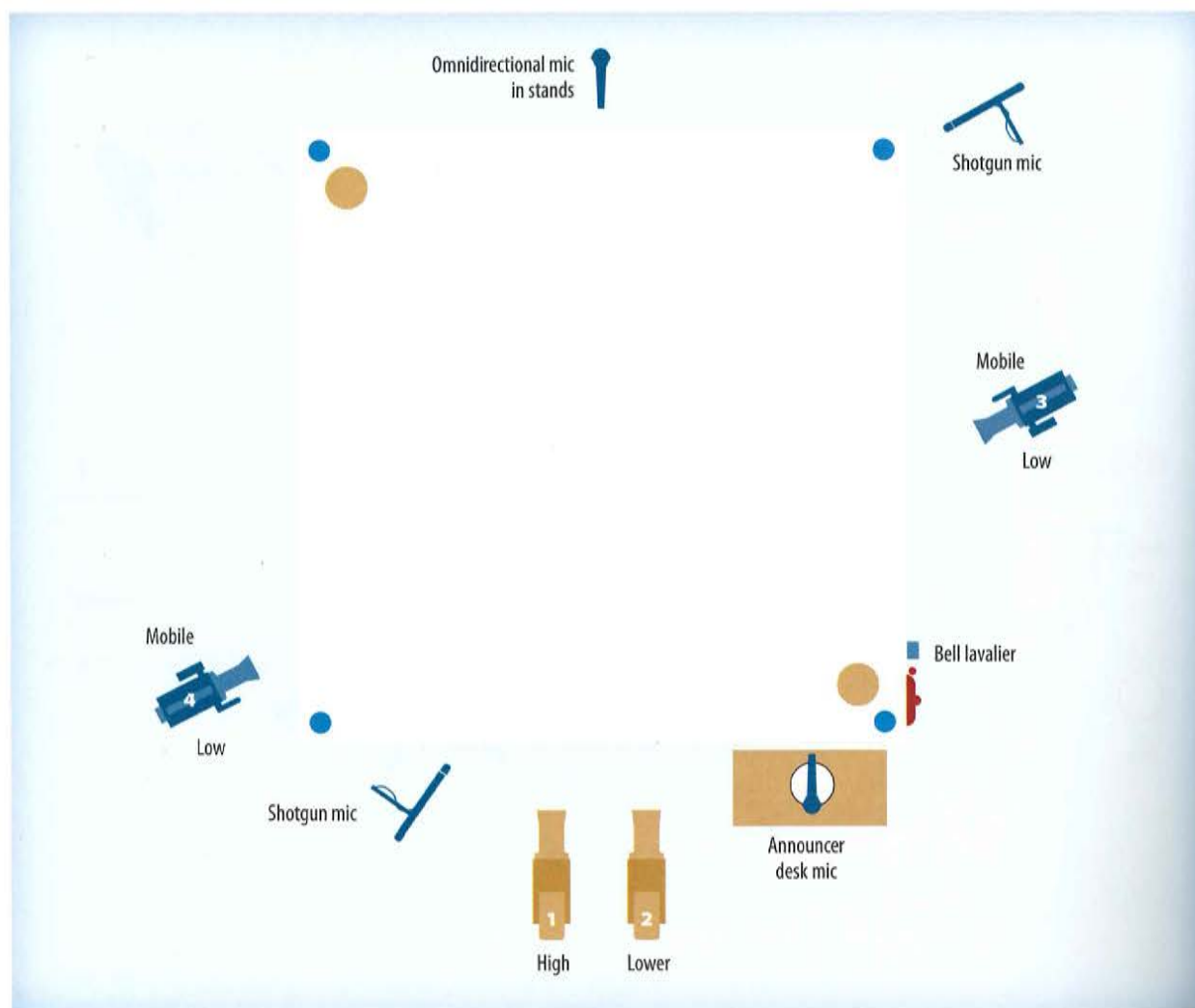
17.13 TENNIS SETUP

Number of cameras: 3 or 4

- C1: At end of court, high enough so that it can cover total court, shooting with the sun
- C2: Next to C1 but lower
- C3: At side of court, opposite officials or where players rest between sets (mobile); also shoots CUs of players
- C4: If four cameras are used, C3 shoots CUs of left player, C4 of right player

Number of mics: 5

- 1 omnidirectional mic in stands for audience
- 1 omnidirectional mic for referee's calls
- 3 shotgun mics at center court and on each end of court for game sounds, or 2 parabolic mics on the ends of the court



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17.14 BOXING OR WRESTLING SETUP

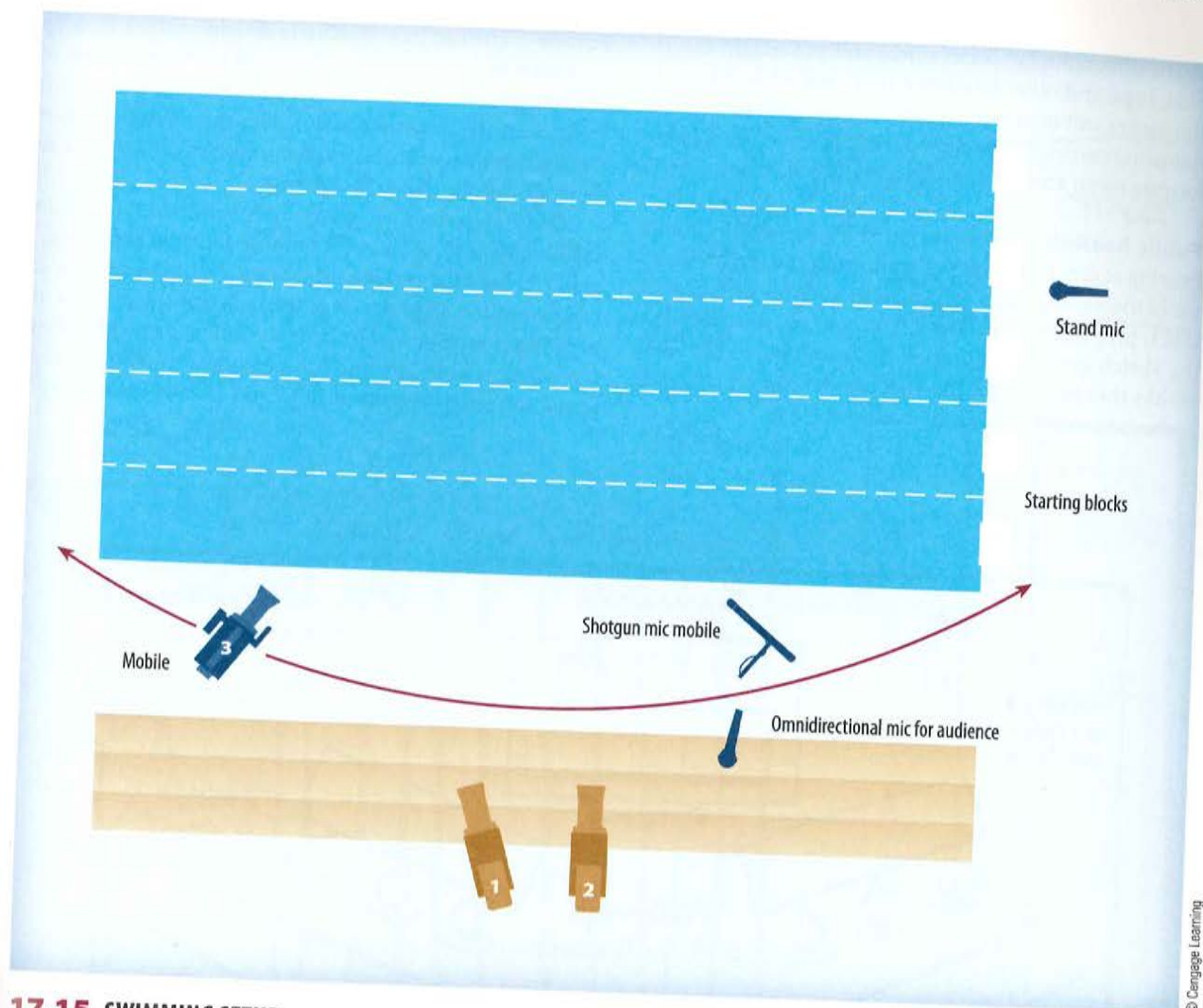
Number of cameras: 3 or 4

- C1: High enough to overlook the entire ring
- C2: About 10 feet to the side of C1; lower but still slightly above ropes; used for replays
- C3: ENG/EFP mobile camera carried on floor, looking through the ropes
- C4: ENG/EFP mobile camera carried on floor, looking through the ropes

All mobile cameras have their own camera shotgun mics.

Number of mics: 5

- 1 omnidirectional mic for audience
- 2 shotgun mics for boxing sounds and referee
- 1 lavalier for bell
- 1 desk mic for announcer



17.15 SWIMMING SETUP

Number of cameras: 2 or 3

- C1: High in stands, about at center of pool—follows swimmer
- C2: Next to C1—gets close-ups
- C3: Optional ENG/EFP mobile camera on side and ends of pool

Number of mics: 3

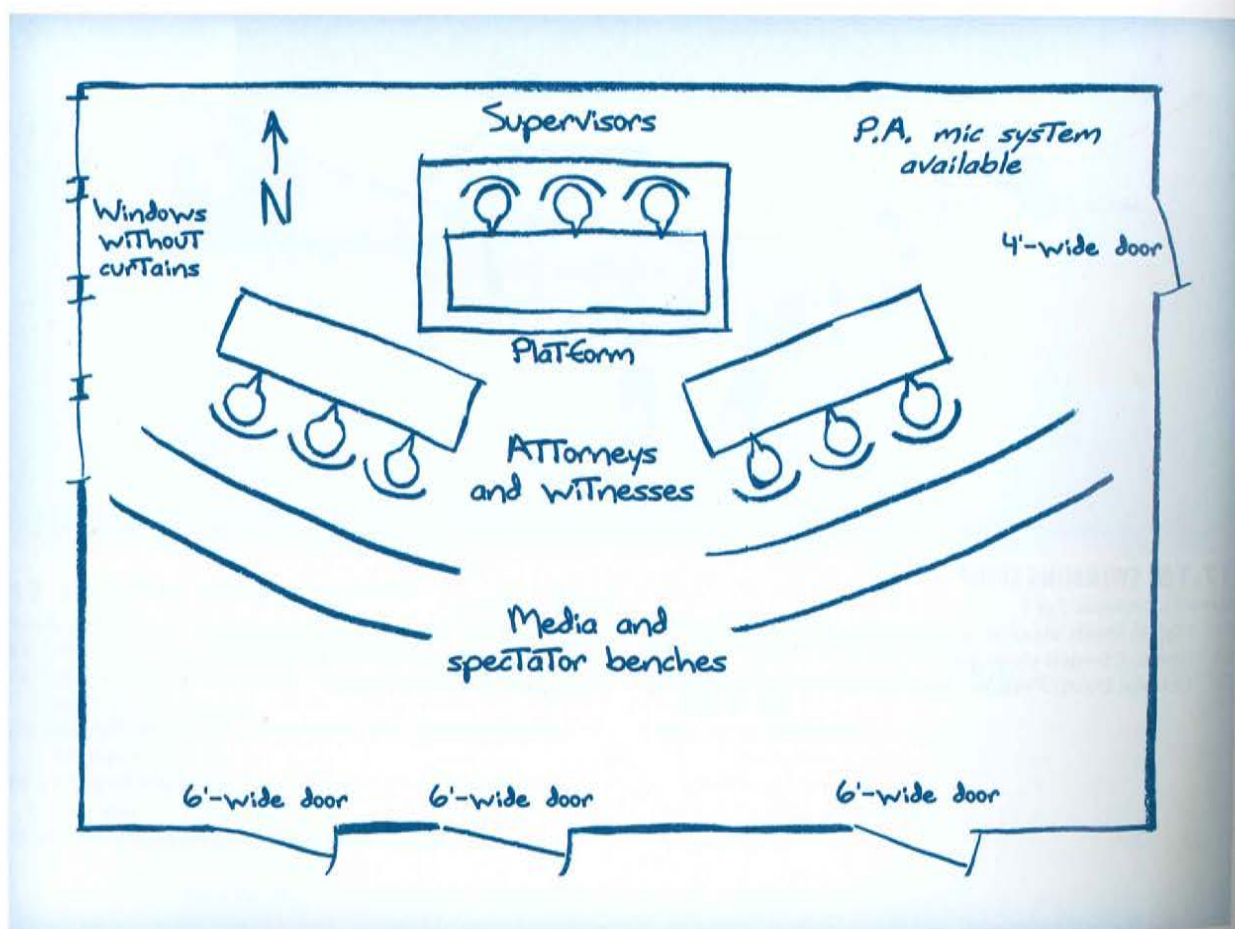
- 1 omnidirectional mic in stands for audience
- 1 shotgun mic at pool level for swimmers
- 1 omnidirectional mic on stand

stairs; directions the doors open; and prominent thresholds, rugs, and other items that may present problems for the movement of cameras mounted on tripod dollies. The following two examples show a location sketch for a public hearing room and an outdoor location sketch for a parade.

Public hearing The occasion is a newsworthy public hearing at city hall. **SEE 17.16** Assuming you are the director of the remote, what can you tell from this sketch? How much preparation can you do? What key questions does the sketch generate? Limiting the questions to the setup within this hearing room, what are the camera, lighting, audio, and intercom requirements?

Parade The outdoor remote is intended for a Sunday afternoon live multicamera telecast. The estimated time of the telecast is from 3:30 to 5:30 p.m. The location sketch in figure 17.17 shows the action area as well as the major facilities. What setup and production clues can you devise from this location sketch? **SEE 17.17**

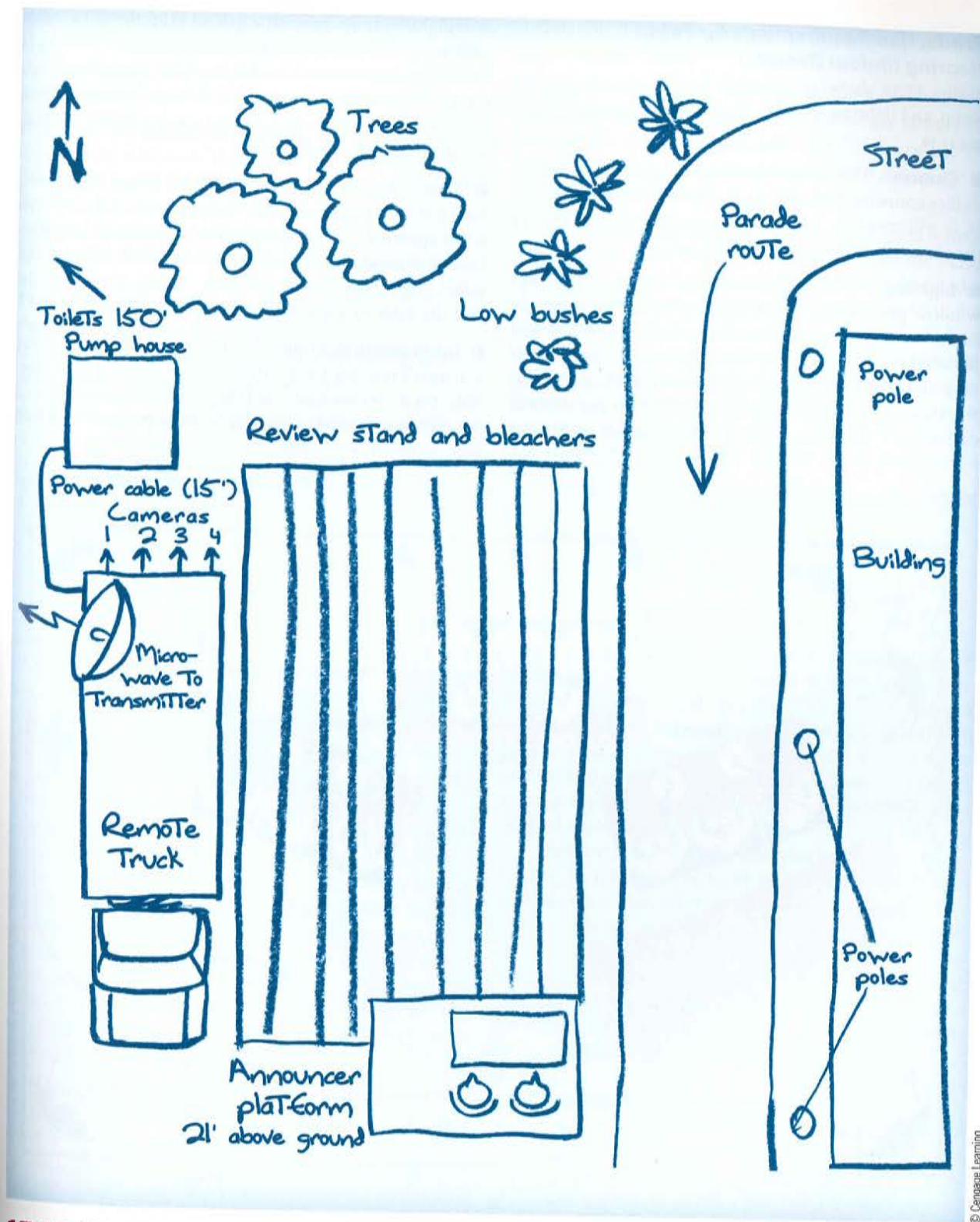
Before continuing, study both the indoor location sketch (figure 17.16) and the outdoor location sketch (figure 17.17) and list as many production requirements as you can determine, then pencil in the type and the placement of cameras and microphones. In the following section, you can compare your lists and equipment placement with the suggested setups in figures 17.18 and 17.19.



17.16 LOCATION SKETCH OF CITY HALL HEARING ROOM

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17.17 LOCATION SKETCH OF PARADE

Production Requirements for Public Hearing (Indoor Remote)

Figure 17.18 shows the possible camera placement, mic setup, and lighting solutions for the public hearing room.

SEE 17.18

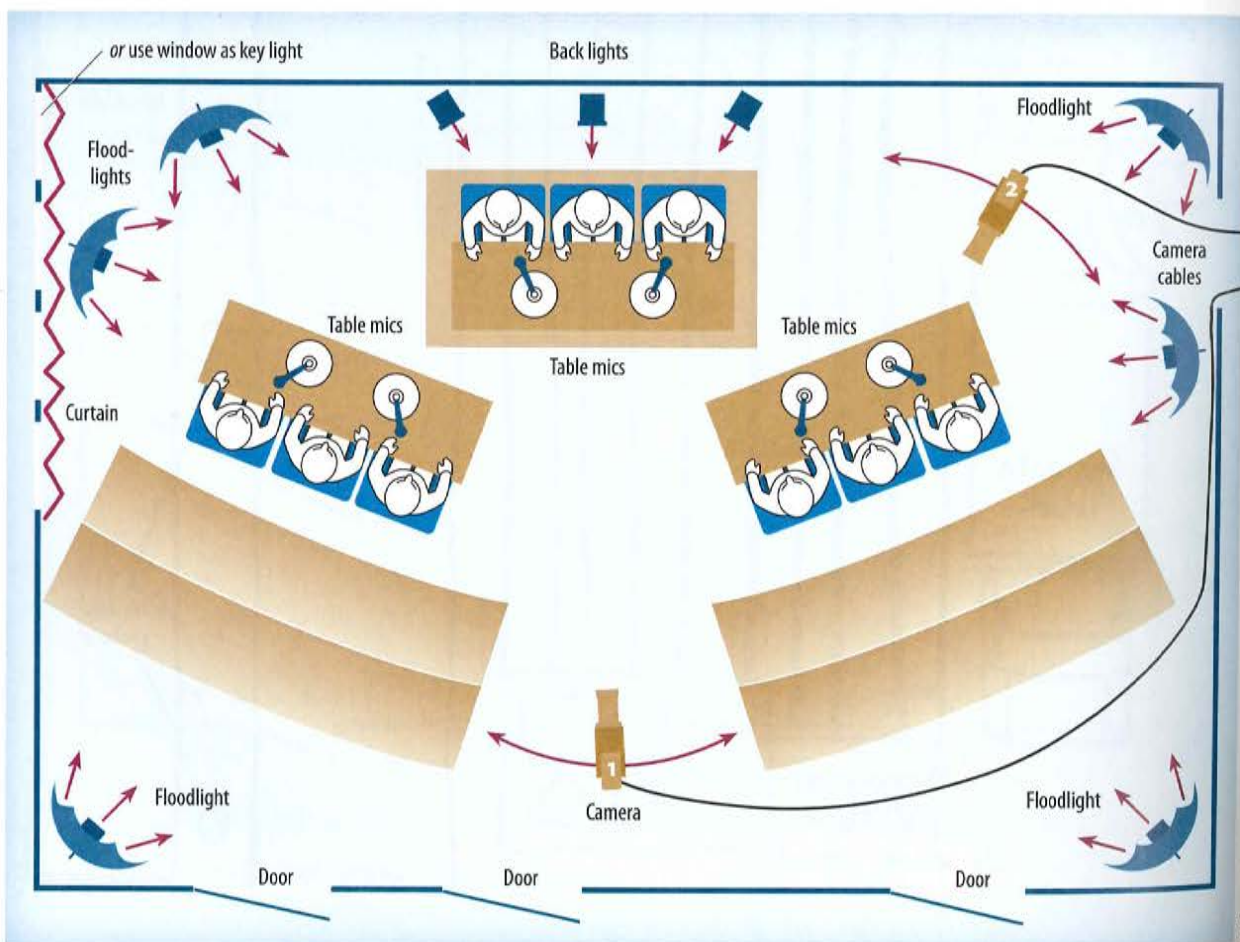
■ **Cameras.** This setup requires two cameras on tripod dollies connected by cable to the remote truck. Camera 1 (C1) will cover the supervisors; camera 2 (C2) will cover the attorneys, witnesses, and spectators.

■ **Lighting.** The hearing is scheduled for 3 p.m. The large window presents a definite lighting problem. There are two solutions: (1) cover the window with drapes and add floodlights or (2) have C2 truck closer to the supervisors' table and try to avoid shooting the window when covering the attorneys at the window-side table. Now the window can act as a large key light. In this case, all additional

floodlighting must have blue gels to raise the color temperature to the outdoor (5,600K) standard. If the ceiling is high enough, place some back lights. Are there enough AC outlets for the lights? Are they on different circuits? There may be some access problems if the mic and lighting cables are strung across the doorways.

■ **Audio.** Because the hearing room is already equipped with a P.A. system, tie into the existing mics. If the system is not operational, desk mics are the most logical solution. One additional mic should be placed on each of the three tables (supervisors' table and two witness tables) just in case the existing audio system malfunctions.

■ **Intercommunications.** The best solution for the floor manager's intercom is a wireless setup. If this is not possible, the floor manager could plug the headsets into one of the cameras, especially because he does not have to move



17.18 HEARING ROOM WITH FACILITIES

far away from the camera for the few cues he has to give. If ENG/EFP cameras are used, separate intercom cables may need to be strung for the floor manager and each camera operator.

■ **Other considerations.** Camera cables can be routed through the side door. If the room has a hardwood floor, the cameras could dolly into position for optimal shots. Because there is much traffic in the room, all cables must be taped to the floor and covered by rubber mats. C1 will be in heavy traffic because of the public access doors.

Production Requirements for Parade (Outdoor Remote)

Now compare your list and sketch for the parade with the setup shown in the next figure. **SEE 17.19**

■ **Location of remote truck.** The truck is in a good location. It's fairly close to a power source (pump house) and the camera positions, minimizing cable runs.

■ **Cameras.** You'll need a minimum of four cameras: C1 and C2 (studio/field cameras) on top of the bleachers, and C3 and C4 (ENG/EFP) on the street. C2 can also cover talent. If possible, C4 should be mounted on a field jib at street level.

■ **Lighting.** The parade is scheduled for 3:30 to 5:30 p.m., which gives you sufficient sunlight throughout the telecast. Because the sun will be mostly behind the cameras, you may need a device to prevent the sun from washing out the viewfinders of cameras 1 and 2.

■ **Audio.** There are three types of audio pickup: (1) the voice pickup of the two announcers, (2) the bands in the parade, and (3) the sounds of the spectators. Use lavalier mics with windscreens or headset mics for the talent. Use three shotgun or parabolic mics (one high in the stands, the others just above ground level) for the bands. Use two omnidirectional mics on the platform for the crowd noise. All mics need windscreens, and the shotgun mics need wind jammers. One of the shotgun mics could be aimed at the street turn to increase the audio pickup zone. This will enable you to hear the band when you use a tight zoom shot of it coming around the bend.

■ **Intercommunications.** The camera operators are connected to the normal PL lines of the camera cables. You'll need a separate intercom line for the floor manager's headset. Use IFB for the talent. Unless you rely on your cell phones, you will need at least two telephone lines for intercommunication from the truck: a direct line to the

station and the transmitter and another line for general voice communication.

■ **Signal transmission.** You will use a direct microwave link to the transmission tower (and from there to the station). Audio is sent via telephone lines (independent of microwave). This separation ensures audio continuity if the microwave link fails.

■ **Other considerations.** Cameras 1 and 2 need a field lens to catch close-ups of the action around the bend (40×). You will need a large monitor for the talent and a second monitor for backup. Shade the monitors from the sun. Route the cables underneath the platform to reduce the potential tripping hazard. The ENG/EFP cameras (C3 and C4) need cable pullers in addition to the camera operators. Toilet facilities are fairly close to the pump house. Raincoats and umbrellas may be needed for crew, talent, and cameras just in case the weather report predicting a beautiful day is wrong.

COMMUNICATION SYSTEMS

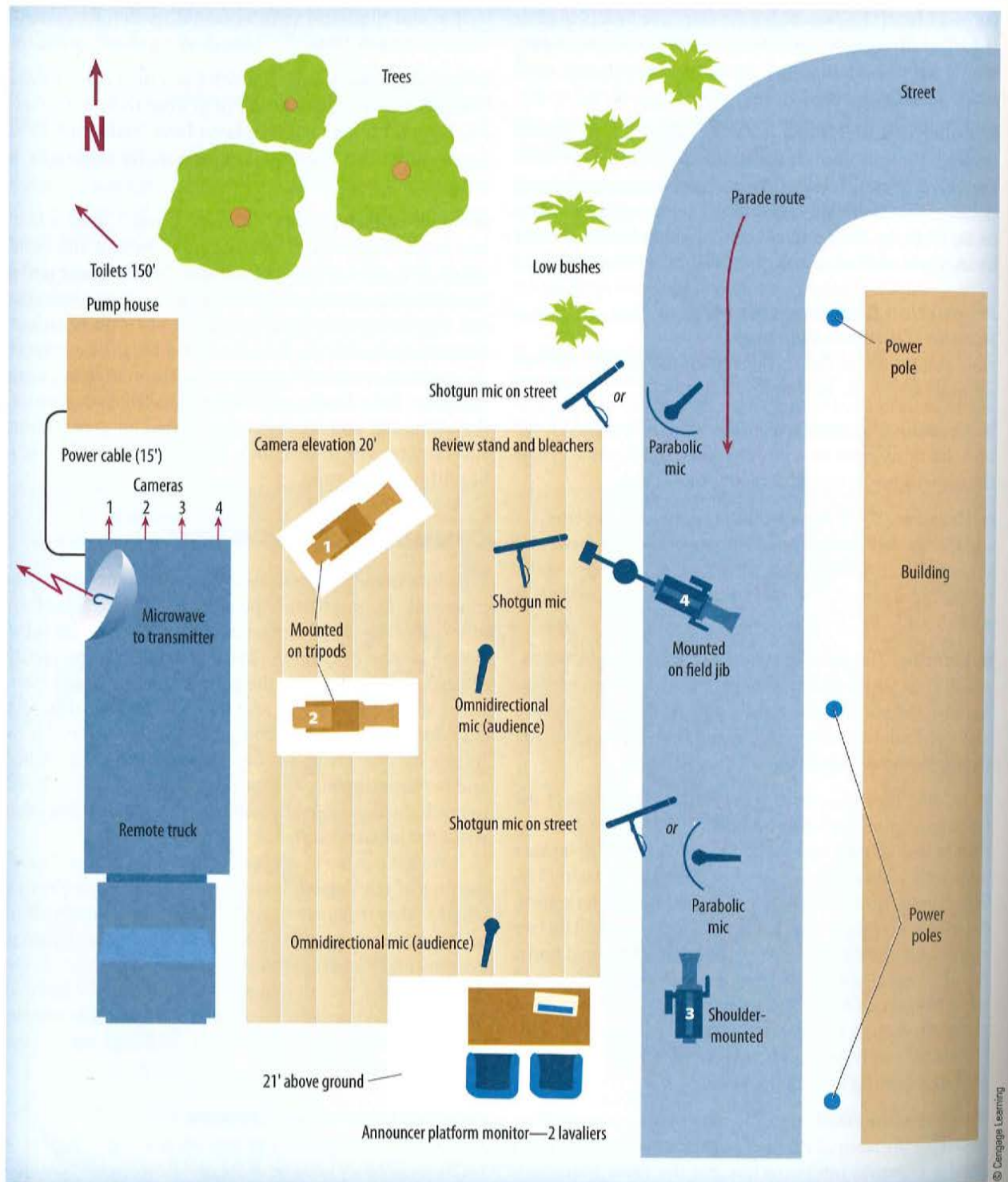
Well-functioning communication systems are especially important for production people in the field, regardless of whether the "field" is the street corner across from the station or one in London. These systems must be highly reliable and must enable the people at home base to talk with the field personnel, and the field personnel to talk with one another. When doing ENG you must be able to receive messages from the newsroom as well as the police and fire departments. As a producer or director, you need to reach the talent directly with specific information, even while the talent is on the air.

We have come to expect the relatively flawless transporting of television pictures and sound, regardless of whether they originate from the mayor's downtown office or the orbiting space station. Although communication systems and signal distribution are the province of the technical crew, you should still be familiar with them so that you will know what is available to you. This section provides a brief overview of ENG, EFP, and big-remote communication systems.

ENG Communication Systems

Electronic news gathering has such a high degree of readiness not only because of the mobile and self-contained camera/recorder/audio unit but also because of elaborate communication devices. Most ENG vehicles are equipped with cell phones, scanners that continuously monitor the





17.19 LOCATION SETUP FOR PARADE

frequencies used by police and fire departments, a paging system, and two-way radios. Scanners lock in on a certain frequency as soon as they detect a signal and let you hear the conversation on that frequency. Cell phones are by far the simplest and most reliable system to keep the reporters and newsrooms connected with one another. They also ensure privacy so that the competition cannot tune in on your conversation and scoop a breaking story.

EFP Communication Systems

A single-camera EFP needs the least sophisticated communication system. Because the director is in direct contact with the crew and the talent at the event location, no intercom system is needed. Generally, widely dispersed crewmembers keep in touch with one another via walkie-talkies or cell phones. As pointed out earlier, a small power megaphone might save your voice when giving directions collectively to talent and crew.

The EFP van is normally equipped with phone jacks for regular phone connections, but cell phones usually suffice. If the EFP uses multiple cameras that are coordinated from a central location, a headset intercom system must be set up for the communication among director, TD, and crew. When doing a live telecast from the field, an IFB system is added.

Big-Remote Communication Systems

Big remotes need communication systems between the remote truck (or any other remote control room) and the production people and crew, between the truck and the station, and between the truck and the talent. The truck and the production crew communicate through a regular PL system, which uses the PL channels in the camera cable, separately wired PL lines, or wireless PLs. During a complicated setup in which the crew is widely scattered (such as when covering a downhill ski race), walkie-talkies are also used. If necessary, the PL communication can be carried by telephone lines from truck to station. For the setup and signal transmission details, the engineers use their own phone line.

The IFB system is one of the most important lines of communication between the producer or director and the talent during a big remote. If several reporters or commentators are involved in the same event, you can switch among several IFB channels so that, if necessary, you can address the field reporters and the commentators individually. If needed, your IFB instructions to the talent can be transmitted via satellite over great distances. Realize,

however, that there is inevitably a slight delay before the talent receives your instructions. In sports remotes the talent occasionally wear headsets through which they receive instructions from the truck.

The remote truck is, of course, equipped with several wired telephone lines, two-way radios, cell phones, paging systems, and walkie-talkies.

SIGNAL TRANSPORT

Signal transport refers to the systems available to you when transmitting the video and audio signals from their origin (microphone and camera) to the recording device or transmitter, and from the point of origin to various reception points. Signal transport includes microwave transmission, cable distribution, cloud broadcasting, and communications satellites.

Microwave Transmission

If you need to maintain optimal camera mobility during a live pickup, such as when shooting interviews from a convention floor, you cannot use a camera cable but must send the signal to the remote truck via microwave.

From camera to remote truck There are portable, battery-powered transmitters that can be mounted on the camera. If the distance from the camera to the receiving station in the truck is not too great, you can use this system to relay the camera video and audio signals to the remote truck without too much difficulty. To minimize interference from other stations covering the same event, you can transmit on several frequencies, a practice called frequency agility.

If you need a more powerful microwave transmitter, you can mount a small microwave dish on a tripod and place it close to the camera action radius. That way you can work at a considerable distance from the remote truck while using only a relatively short cable run from camera to dish. This type of link is especially useful if a cable run would create potential hazards, such as when strung from a building across high-tension wires or across busy city streets. **SEE 17.20**

An ever-present problem with camera-to-truck microwave links is interference, especially if several television crews are covering the same event. Even if you use a system with relatively great frequency agility, your competition may be similarly agile and overpower you with a stronger signal.



17.20 TRIPOD-MOUNTED MICROWAVE TRANSMITTER

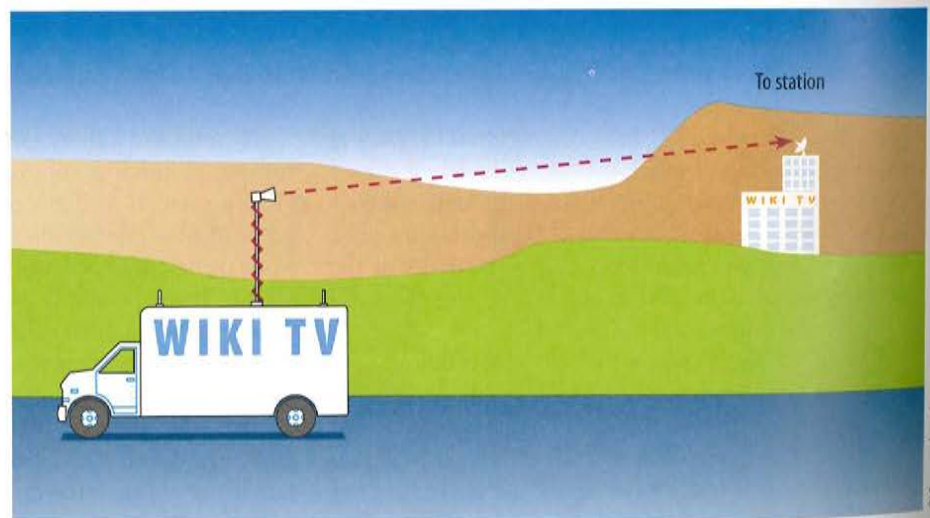
This small tripod-mounted microwave transmitter can relay camera signals over a considerable distance.

From remote van to station or transmitter The longer, and usually much more complex, signal link is from the remote van to the television station. (Although sometimes the signal is sent directly to the transmitter, we will call the end point of this last link before the actual broadcast the “station.”) You can send the signals from the remote van directly to the station only if you have a clear, unobstructed line of sight. **SEE 17.21**

Because the microwave signal travels in a straight line, tall buildings, bridges, or mountains that are in the line of sight between the remote van and the station may block the signal transmission. In such cases several microwave links, called *mini-links*, have to be established to carry the signal around the obstacles. **SEE 17.22**

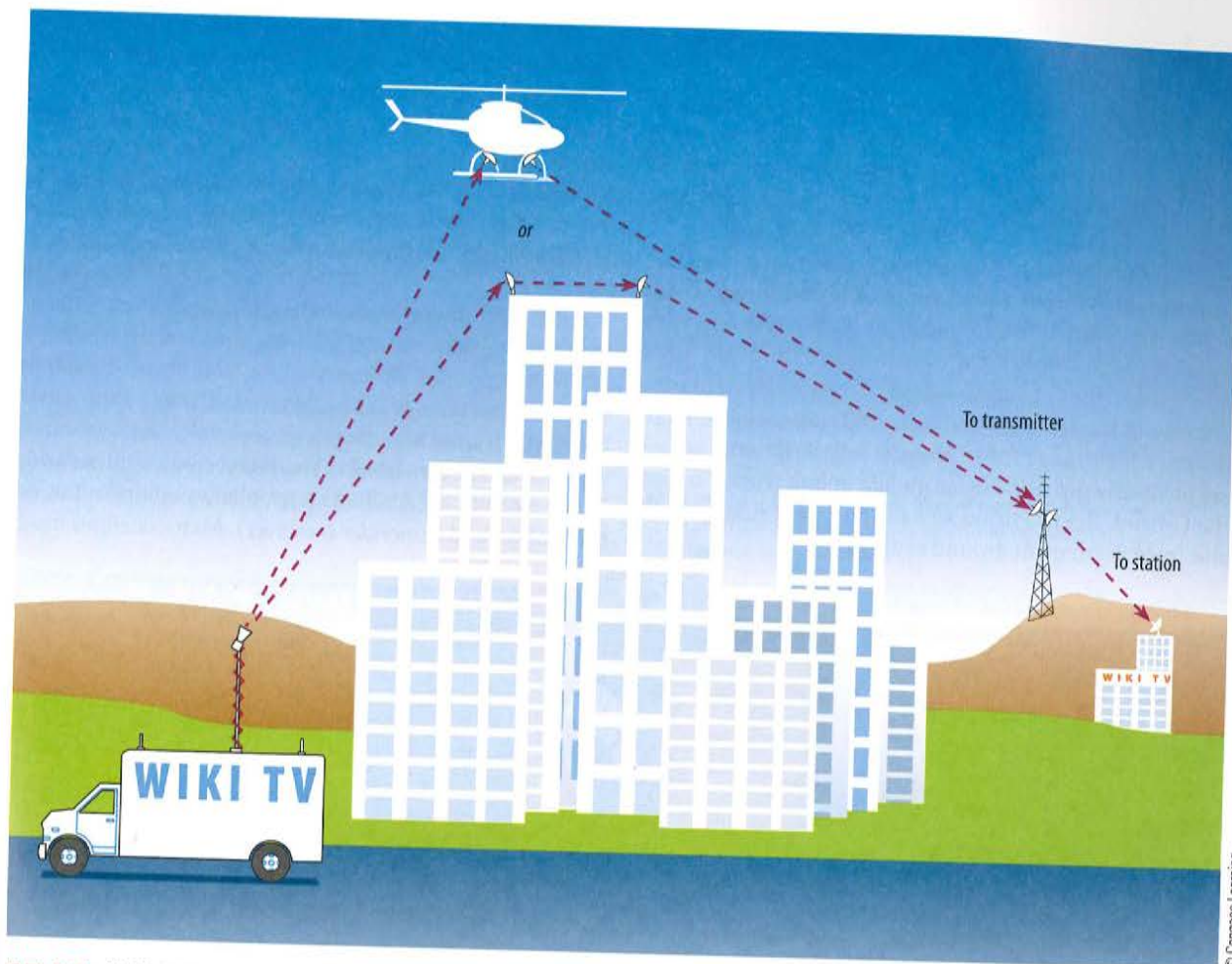
Television stations in metropolitan areas have permanent *microwave relays* installed in strategic locations so that remote vans can send their signals back from practically any point in their coverage area. If these permanent installations do not suffice, helicopters are used as microwave relay stations (see figure 17.22). Permanent microwave relays are also used for transmitting the video of permanently installed cameras that monitor traffic and the weather.

There are several other ways to transmit signals from the remote location to the station. Although this is not your responsibility unless you are a broadcast engineer, you should nevertheless have some idea of what is available.



17.21 DIRECT MICROWAVE LINK

You can transmit a signal via microwave from the remote van back to the station only if there is a clear, unobstructed line of sight.



17.22 MINI-LINK FROM REMOTE VAN TO STATION

If there is no clear line of sight between the remote van and the station, the microwave signal must be transported via mini-links.

Cable Distribution

Telephone companies can provide broadband high-definition digital cable service (coax or fiber-optic) that transports all video and audio signals, including HDTV 1080i signals. **Broadband** is a high-bandwidth standard for sending information (voice, data, video, and audio) simultaneously over cables.

Cloud Broadcasting

The various definitions of “cloud” data services remain somewhat cloudy, but they basically mean the sharing of transmission facilities—usually the Internet—to get huge amounts of data, including digital broadcast content, from point A to point B. It is similar to loading container cargo from various shipping companies all on the same freighter

and then having different trucks deliver the container to the various recipients. This is obviously cheaper and more efficient than using your own little ships for transporting your data to specific destinations.

Communications Satellites

The communications satellites used for broadcast are positioned in a geosynchronous orbit 22,300 miles above the earth. In this orbit the satellite moves synchronously with the earth, thereby remaining in the same position relative to it.

Communications satellites operate on two frequency bands: the lower-frequency C-band and the higher-frequency **Ku-band** (pronounced “kay-you-band”). Some satellites have transponders for C-band as well as

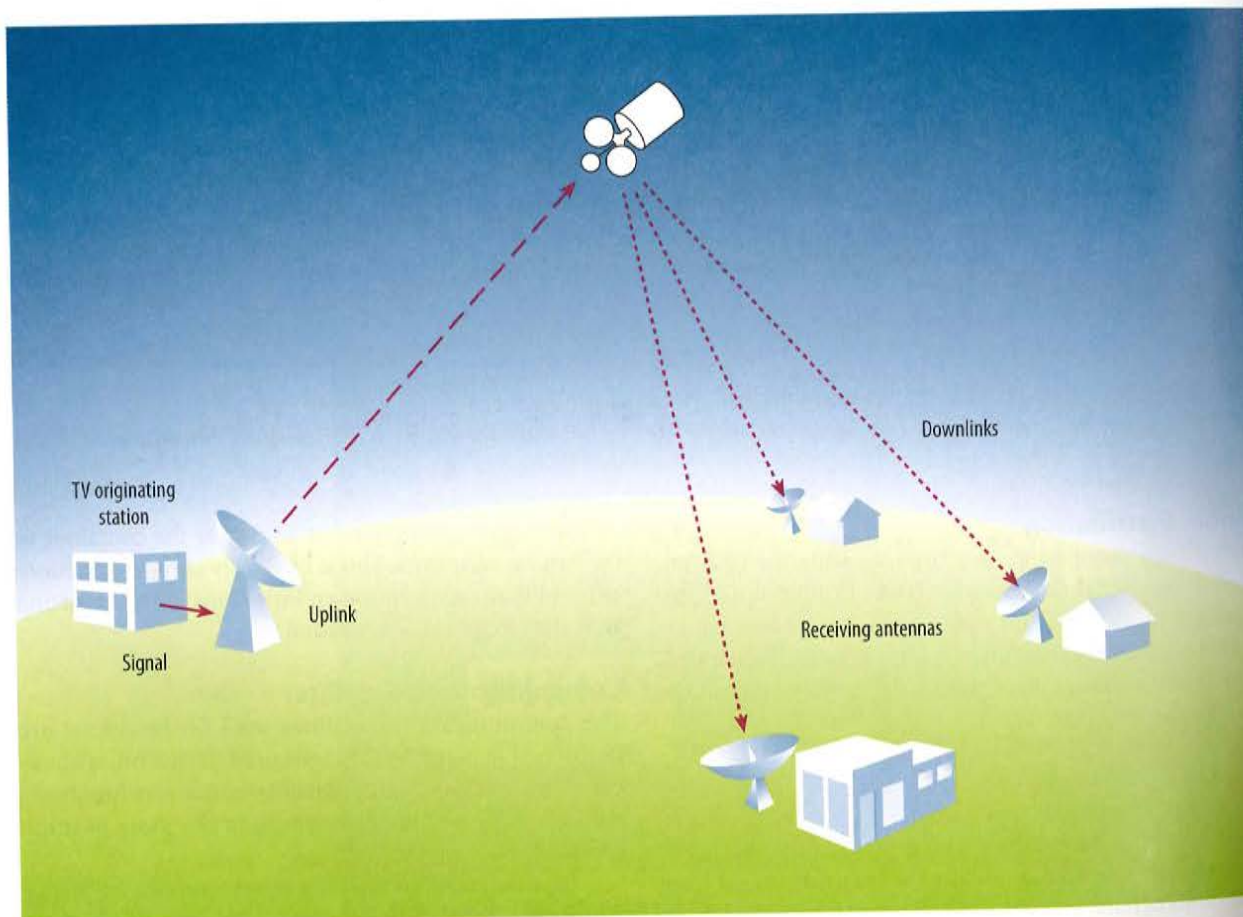
Ku-band transmission and can convert internally from one to the other.

A **direct broadcast satellite (DBS)** has a relatively high-powered transponder (transmitter/receiver) that broadcasts from the satellite to small individual downlink dishes (which you can buy in larger electronics stores and install yourself). A DBS operates on the Ku-band.

The C-band is a highly reliable system that is relatively immune to weather interference. Because the C-band works with microwave frequencies, it may interfere with ground-based microwave transmission. To avoid such interference, the C-band operates with relatively low power; because of the low power, the ground stations need large dishes, which range from 15 to 30 feet. Such large dishes are obviously not suitable for mobile uplink trucks. To use the C-band, the television signals must be transported to and from permanent ground stations.

The Ku-band, on the other hand, operates with more power and smaller dishes (3 feet or less) that can be mounted and readily operated on mobile trucks or on a rooftop. The Ku-band is also less crowded than the C-band and allows immediate, virtually unscheduled access to uplinks. One of the major problems with the Ku-band is that it is susceptible to weather; because of its ultrashort wavelength, rain and snow can interfere with transmission.

Uplinks and downlinks Television signals are sent to a satellite through an **uplink** (earth station transmitter), received, amplified by the satellite, and beamed back at a different frequency (actually rebroadcast) by the satellite's own transmitter to one or several receiving earth stations, called **downlinks**. The receiver-transmitter unit in the satellite is called a transponder, a combination of transmitter and responder (receiver). Many satellites used



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17.23 SATELLITE UPLINK AND DOWNLINKS

The uplink sends television signals to the satellite. The downlinks receive television signals from the satellite.

for international television transmission have built-in translators that automatically convert one electronic signal standard, such as the NTSC system, into another, such as the European PAL system.

Because the satellite transmission covers a large area, simple receiving stations (downlinks) can be set up in many widely dispersed parts of the world. **SEE 17.23** These strategically placed satellites can spread their footprint (coverage area) over the whole earth.

Specialized vans can provide mobile uplinks for the transport of television signals. These **uplink trucks** operate on the very same principle as a microwave van except that they send the television signals to a satellite rather than to a receiving microwave dish. As noted in section 17.1, satellite uplink vans usually contain additional equipment, such as video recorders and editing computers.

MAIN POINTS

- ▶ Many big remotes are devoted to the coverage of sporting events. Networks typically use a great amount of equipment and many personnel for sports remotes, but good coverage is also possible with less equipment.
- ▶ There are standard setups for most sporting events, which can be augmented with more cameras and audio equipment.
- ▶ Location sketches are a valuable preproduction aid for big remotes. For an indoor remote, they may show the general dimensions of a room or hallway; the locations of windows,

doors, and furniture; and the principal action areas. Outdoor location sketches may show buildings, remote truck location, power source, steep inclines or steps, the path of the sun, and the location and direction of the main event.

- ▶ A good location sketch can aid the director and the technical supervisor in deciding on camera locations, focal lengths of zoom lenses, lighting and audio setups, and intercommunication systems.
- ▶ Big-remote operations depend heavily on reliable intercommunication systems, including the PL (party line, private line, or phone line) system, P.A. (public address) system, walkie-talkies, pagers, cell phones, and multichannel IFB (interruptible foldback or feedback) systems. The IFB information can be transmitted via telephone lines and satellite to widely scattered talent in remote locations.
- ▶ Remote signals are usually transported via microwave transmission, cable distribution, cloud broadcasting, or communications satellites.
- ▶ Communications satellites used for broadcast operate in the lower-frequency C-band and the higher-frequency Ku-band.

ZETTL'S VIDEO LAB



For your reference or to track your work, the *Zettl's VideoLab* program cue in this chapter is listed here with its corresponding page number.

ZVL1 PROCESS → Methods → location | studio **374**