RS C

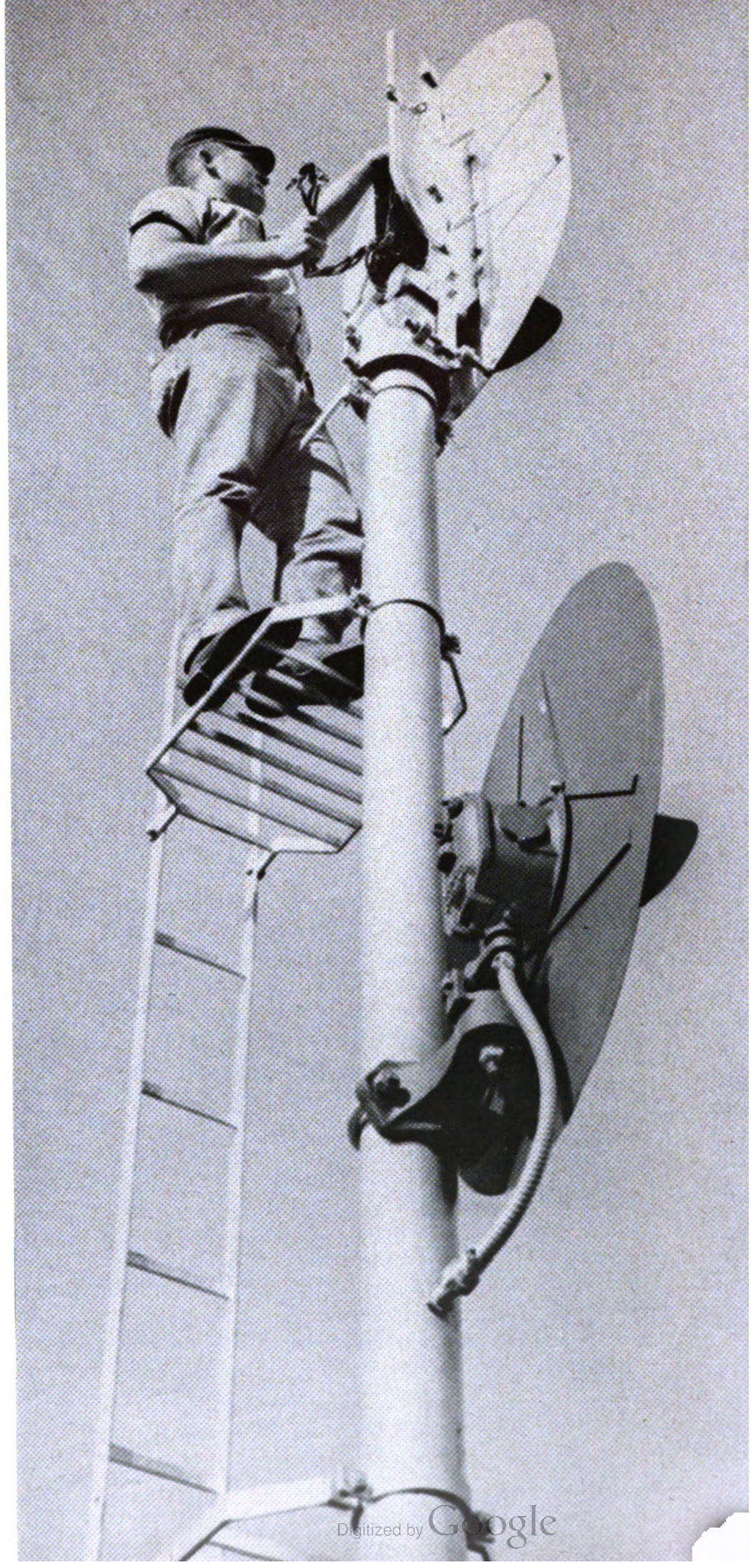
1962 OUTLOOK

RSC's signal construction outlook 1962 begins on this page, and the mmunications outlook for 1962 be- ns on page 17. A review of C&S tivity in 1961 is on page 12. Tables last year's signal installations begin page 13. Communications tables gin on page 16.

ailroads have budgeted $57,917,- 100 in capital expenditures for naling facilities during 1962. This is increase of about 20% over last ar, according to a recent *Railway gnaling and Communications* survey. venty-three railroads planning to in- ase capital expenditures for signal- in 1962 reported budgets totaling 4,201,600. A total of $10,342,100 is dgeted by 13 roads who say their ital spending plans for signaling the same as last year. And 23 rail- ds say that they will spend less for naling in 1962 than in 1961; their dgets total $3,373,400.

Centralized traffic control leads all ier projects in the 1962 spending ns of U.S. and Canadian railroads, reported to RS&C. Eighteen roads ve CTC plans approved for this ar, 11 of which expect to install a al of 1,829 road-miles. This is 85 d-miles more than was installed by railroads in 1961. The reporting ds also indicated that 359 miles of ck would be taken up as a result of se CTC installations. Several rail- ds are replacing double-track auto- tic block signaling with single- ck CTC.

Other areas of significant signal struction activity include interlock-



ings, highway crossing protection and automatic retarder classification yards. In the latter category, no automatic yards were completed in 1961; only three were started. Five roads reported that each will start construction of an automatic yard during 1962. Nineteen railroads reported plans to install flashing-light signals and/or flashing-light signals with automatic gates at 685 highway-railroad grade crossings. Another 12 roads state that their highway crossing protection programs in 1962 will be equal to or greater than the 1961 programs. Interlocking construction centers around consolidations of existing plants and replacement of attended plants with automatic interlockings. The survey shows 11 railroads installing 90 interlockings, of which 32 are automatic plants. Six other roads reported activity in this field, but gave no specific figures.

Hotbox detector installations will also hold strong during the coming year, although survey results show only 28 detectors are presently in signal department budgets. One industry source estimates that total installations will probably be in the neighborhood of 150 hotbox detectors. Manufacturers report that orders for these safety devices already show an increase over a year ago.

Automatic train operation (ATO), a popular topic among railroad men, Wall Street security analysts, labor leaders and politicians, should make headlines in 1962 when two installations are expected to be placed in service. One, hailed as the world's first all-automatic railway, is the Carol Lake ATO installation on the six-mile Carol Lake Railway between the Smallwood, Labrador, iron ore mine and Iron Ore Co. of Canada's concentration plant at Wabush Lake. Hardware is now being readied, with testing scheduled for this spring and operation soon thereafter. Claude K. Howse, Newfoundland representative of the Iron Ore Co. of Canada, has said: "We will be moving 50,000 tons [of iron ore] a day, which will be hauled six miles by rail to our $70-million concentrating plant. Ninety-six trains a day will run over a single track, and not a person on them —the world's first automatic railway." He said his company's part of the project would come into production in July 1962.

The other ATO installation, probably the most talked about, is the New York City Transit Authority's crewless subway train that is in test service on the Grand Central Terminal-Times Square shuttle. Testing was completed and the automatic train was ready to run December 15, 1961, when a threatened strike by the Transport Workers Union (representing motormen and conductors) prompted Arbitrator Theodore W. Kheel to order the in-service operation to be postponed until after the new contract between the TWU and NYCTA became effective this year.

Although the crewless subway train was the subject of much heated debate between TWU President Michael J. Quill ("Gadget or no gadget, the motormen and conductors will stay on the trains") and NYCTA Chairman Charles L. Patterson ("There is nothing revolutionary. . . . It is simply a step forward"), it will run for a six-month experimental period with a TWU motorman on board. After this period, TWU and NYCTA will talk about the man power problem on this and other (future) ATO installations on the subway. NYCTA has indicated the desirability of automating the other two GCT-TS shuttle runs as well as three others, and possibly trains running to the 1964 World's Fair on Long Island.

Other ATO installations are on the drawing boards, and some are far enough along so that the electronic equipment is being developed. Field testing of ATO should continue this

(Please turn to page 17)

C&S Activity Down in 1961

Although indications were that communications and signal activity in 1961 would be at the previous year's level, the railroads declining income sent C&S construction to its lowest levels since 1957–58. Communications facilities installed during 1961 totaled 8,548 units, a drop of 46% from 1960. Signal construction fell 31% from the previous year to 6,370 units installed in 1961. The last equivalent years for this level of C&S construction were 1957 for communications (8,445 units) and 1958 for signaling (5,929 units). Since then, C&S activity had risen until the 1961 fall off.

In spite of the gloomy year, significant technological developments and activity trends added a cheery note to the overall performance. As anticipated by many, microwave continued to hold the communications spotlight. D&RGW placed its 700-mile microwave and facsimile system into full operation. CN, AT&SF, SOU and UP placed important microwave links in service and let sizeable contracts for additional microwave systems. On the FCC front, the railroads and AT&T agreed over interconnection. A Commission decision is expected within a month or two. An investigation is now underway by the FCC into AT&T's Telpak tariff (the telephone company's bid to compete with private microwave systems by providing bulk communications channels).

On the signal side, automatic train operation tests were continued by the NYCTA on its crewless Times Square-Grand Central Terminal shuttle train. It went into experimental passenger operation Jan. 4. A coke-quenching railway operation placed in service during 1961 utilized an automatically controlled crewless locomotive and the SAL installed "talking" hotbox detectors which radio hot journal locations to train crews and dispatchers.

Signal Facilities Installed in 1961

Summary of Signal Equipment Installed, 1959–1961

	1959	1960	1961
Traffic control and block signal systems			
Track miles*	2,370.8	3,319.7	**2,116.2**
Controlled signals	1,485	2,116	**1,167**
Automatic signals	1,349	1,547	**1,134**
Power switches	536	849	**452**
Spring switches	94	77	**55**
Electric locks	426	828	**523**
Automatic train stops (ATS)	155	196	**234**
Rolling stock with ATS	174	—	**—**
Cab signals	2	13	**3**
Classification yards			
Retarders	48	57	**15**
Power switches	164	463	**59**
Highway crossings protected			
Flashers only	1,012	1,095	**1,128**
Gates and flashers	387	382	**425**
Interlockings			
Power switches	264	323	**275**
Home signals	440	527	**510**
Distant signals	142	147	**94**
Safety devices			
Broken flange detectors	10	15	**15**
Dragging equipment detectors	23	17	**37**
Hotbox detectors	121	141	**115**
Slide fence, feet*	39,125	39,966	**16,461**
Other	—	74	**19**
Spring switches (not in TCS)	47	125	**53**
Facing point locks	17	63	**17**
Signals at spring switches	61	182	**40**
Totals	6,957	9,237	**6,370**

* Excluded from totals.

Yard Signaling Installed During 1961 on U. S. & Canadian Railroads

B&M	Mechanicville, N. Y.	1 master retarder
CNR	Montreal, Que.	6 non-interlocked switches, 1 cab signal
CGO	Russell, Ky.	1 interlocked switch
CMStP&P		1 yard control system for 21 switches
MP	No. Little Rock, Ark.	13 retarders, 41 class tracks, 40 non-interlocked switches, 2 cab signals
NGW	Roanoke, Va.	1 retarder, 9 class tracks, 6 interlocked and 6 non-interlocked switches

1961 Hotbox Detectors Installed

AT&SF	2	GM&O	1
ACL	5	L&N	9
B&O	2	NYC	23
B&M	2	N&W	5
CNR	2	SAL	28
CGO	5	SOU	10
CGEI	3	SP	7
CMStP&P	5	T&P	2
FEC	3	Total	115
D&H	1		

Miscellaneous Detectors Installed

AT&SF	2 flood detectors
FEC	4 track circuit controlled traffic signals
NYCTA	15 smoke detectors
StL-SF	1 OS'ing device
SP	1 high load detector
	1 mudslide detector
SPS	12 motor car indicators

Railroad-Highway Grade Crossing Protection Installations in 1961

Railroad	Flashers	Gates
ALASKA	2	1
AT&SF	88	31
A&SAB	6	—
A&WP	—	1
ACL	30	12
B&O	25	13
BAR	1	—
B&M	8	8
CNR	175	37
CPR	124	16
CofGa	6	1
CNJ	6	2
CV	—	2
C&O	18	9
CGEI	1	1
C&IM	1	—
C&NW	48	9
CB&Q	15	10
CGW	4	1
CMStP&P	26	4
CNS&M	—	2
CRI&P	29	12
CSS&SB	1	3
CTA	—	1
D&H	2	2
D&RGW	12	—
DT&I	—	4
DM&IR	3	—
E-L	2	5
FEC	5	4
GA	—	1
G&F	4	4
GN	20*	9
GB&W	1	—
GM&O	12	1
IC	15	34
IT	1	—
KCS	12	—
KCT	1	—
LI	2	6
L&N	11	4
MeC	7	9
MKT	8	2
MP	23	10
MONON	4	—
NYC	53	32
NYC&StL	15	10
NYNH&H	7	—
N&W	4	5
NP	13	2
ONL	1	—
PGE	4	—
PRR	33	29
PRS	7	—
P&N	2	—
P&LE	—	2
P&WV	1	—
QC	2	—
RDG	—	6
StL-SF	18	1
StL-SW	7	—
SAL	18	11
SOO	1	15
SOU	23	2
SP	105	18
TRRStL	—	6
T&P	11	—
TP&W	2	—
TH&B	1	1
UP	27	5
WAB	9	7
WM	—	2
WP	5	—
Total	1,128	425
100% RR Funds	192	122
100% non-RR Funds	133	40
Joint RR & non-RR Funds	803	263

* Includes 15 rotating stop signals.

Centralized Traffic Control Installed in 1961

Railroad	Location	Road Miles	Switches	Locks	Signals	
AT&SF	Maine-Williams Jct., Ariz. (ABS)	12.2		12 ats		
	Ethel-WB Jct., Mo.	58	21	35	33 c	72 a
	Lubbock, Tex.-Texico, N. M.	88	15	44	49 c	24 a
	Clovis, N. M., Yard	3.2	21		23 c	
	Maine-Williams Jct. and Crookton-Seligman, Ariz.	19.9	10	4	14 c	24a
	Belt Jct.-Birds, Tex.	3.6	1 ss	3	3 c	
ACL	Contentnea-Micro, N. C.	19	4	5	12 c	12 a
	Smithfield-S. Beard, N. C.	39.9	10	26	28 c	30 a
B&O	Bayview, Md.-Philadelphia, Pa.	86.5	17	36	42 c	52 a
	Orleans-Okonoko, W. Va.	13.2		2		8 a
	Patterson Creek, W. Va.-McKenzie, Md.	6.3			2 c	4 a
	New River-SD Cabin, O.	26.9	7	14	17 c	14 a
B&M	Seven segments in Mass.	15.5	4	5	14 c	5 a
CNR	Car repair shop			12		
	London, Ont.					1 a
	Alexandria, Ont.			1		
	Turcot-Dorval, Que.	7	52	8	30 c	14 a
	Montreal-Eastern Jct., Que.	4	4	17	12 c	
	Portage la Prairie, Man.-Melville, Sask.	224	28 + 25 ss	19	109 c	53 a
	Pacific Jct.-Napadogan, N. B.	107	14 + 9 ss	4	49 c	22 a
CPR	Bordeaux-Lovalde Rapid, Que.	0.3	gauntlet		4 c	
	Indian Head-Moose Jaw, Sask.	83.1	20		56 c	43 a
CofGa	Sterrett-Trammells, Ala.	29.6	1 ssl	3	28 c	
C&O	Covington-BS Cabin, Va.	4.3	12	17	16 c	8 a
	Cabin Creek Jct.-St. Albans, W. Va.	25.5	41	25	80 c	19 a
	Pence-Springdale, Ky.	9.2	2	2	6 c	6 a
	Fowlerville-Trowbridge, Mich.	22.6	4	5	13 c	13 a
	Erie, Mich.-Alexis, O.	4.9	2	1	5 c	3 a
C&EI				4		
C&NW	Merrillan-Altoona, Wis. (ABS)	39				18 a
C&WI	Chicago, Ill.	3.3			2 c	10 a
CB&Q	Centralia, Ill.	0.1	3	1	7 c	
CRI&P	Beacon-Eddyville, Ia. (ABS)	10				10 a
CTA	Laramie-Desplaines Ave. (ABS)	3.3		10		42 a
	Wilson-Lawrence Ave. (ABS)	0.5				8 a
Clinchfield	Elkhorn, Ky.-Spartanburg, S. C.			1		
C&S		0.7		1	2 c	
D&H	Colliers-Afton, N. Y.	38	7 + 1 ssl	26	26 c	29 a
D&RGW	Salida-Kobe, Colo.	46.6	6 + 3 ssl	5	36 c	21 a
	Lynn-Soldier Summit, Utah	18.3	10	5	28 c	28 a
DM&IR	Mt. Iron, Minn.	1		2	1 c	1 a
GN	Aylmer-Surrey, N. D.	50	8	9	32 c	
	Pacific Jct.-Chester, Mont.	59.1	12	9	48 c	
	Townsend-Brownsville, B. C.	1.9	1		4 c	
GM&O	Iles-Girard, Ill.	23.5	4	10	12 c	10 a
IC	Oliver-Manchac, La.	15	2	5	6 c	8 a
	Bluford-Metropolis, Ill.	78.5	6 + 6 ss	5	25 c	57 a
	Chiles-Fulton, Ky.	41.3	2 + 3 ss	1	10 c	30 a
KCS	Stilwell-Sallisaw, Okla.	35.5	7	7	21 c	19 a
LI	Hicksville-Syosset, N. Y.	7	1	3	5 c	
L&N	Beauvoir, Miss.-New Orleans, La.	70	12	22	36 c	26 a
	Black Creek-Nyota, Ala.	15	2	5	6 c	8 a
MeC	Bangor-Calais Jct., Me.	1.1	2		6 c	1 a
NYC	Cleveland, O. (ABS)	0.7		1 ats		
	Toledo, O. (ABS)	1.9		4 ats		
	Weehawken-Hoboken, N. J.	4	1		8 c	4 a
	[illegible]	11	3		11 c	4 a

Interlocking Construction During 1961

Railroad	Location	Type	Switches	Signals	
AT&SF	Chicago, Ill.	NF	1	3 h	
	Galesburg, Ill.	RF	7	11 h	
	Henrietta, Mo.	RF	2	10 h	
	CA Junction	RF	8	6 h	
	Sibley, Mo.	RF		4 h	
	Lockney, Tex.	AA		4 h	4 d
	Plainview, Tex.	AA		4 h	4 d
	Daggett, Calif.	RC-F			
	San Bernardino, Calif.	CF			
	San Bernardino, Calif.	AM	2	2 h	
ACL	Sanford, Fla.	RM			
B&O	Five in Philadelphia, Pa.	NF	50	47 h	
B&M	Boston, Mass.	RM	1	1 h	
	South Acton, Mass.	AF		1 h	1 d
	Nashua, N. H.	RA		1 h	
CNR	Niagara Falls, Ont.	RF		8 h	2 d
	St. Hyacinthe, Que.	AF	1	3 h	
CPR	Montreal, Que.	RP	6	8 h	
	Edmonton, Alta.	AF	1	3 h	
C&O	LaMar, Mich.	RF	7	6 h	
	Pelton, Ont.	RF	5	9 h	1 d
C&NW	Chicago, Ill.	NF	4	6 h	
	Oak Park, Ill.	NF	1	3 h	
	Vale, Ill.	AF	2	1 h	
	Rochelle, Ill.	AM		3 h	
	Dearing, Ill.	CP	6	8 h	
C&WI	Oakdale, Ill.	CR-F	3		
CB&Q	Omaha, Neb.	NA		10 h	
	Chillicothe, Mo.	NA		5 h	4 d
CMStP&P	Rondout, Ill.	RF	5		
	Ramsey, Minn.	AF	1		
	Chicago, Ill.	CF			
CTA	Wilson Ave.	AR-M	5	6 h	
E-L	Depew, N. Y.	NF	4	6 h	
	West Alden, N. Y.	AF	1		2 d
	East Alden, N. Y.	NF	1	3 h	2 d
	Attica, N. Y.	NF	2	5 h	1 d
	East Linden, N. Y.	AF	1		2 d
	Rock Glen, N. Y.	NF	1	3 h	2 d
	Silver Springs, N. Y.	NF	2	4 h	2 d
GN	Calumet, Minn.	NA		4 h	
GM&O	Girard, Ill.	RP	1	5 h	1 d
IC	North Litchfield, Ill.	RA		4 h	
	Chicago, Ill.	RA		8 h	
	Nortonville, Ky.	RA		4 h	
L&N	East St. Louis, Ill.	RA		10 h	8 d
	N. Birmingham, Ala.	NA		10 h	5 d
	Wildwood (Wauhatchie), Tenn.	NF	3	5 h	5 d
	Lockout (Wauhatchie), Tenn.	NF	2	4 h	4 d
MeC	Brunswick, Me.	RA	1	3 h	3 d
MTA	Tower A, Boston	AM	2	1 h	
	Copley Jct., Boston	AA	1		
MKT	Denison, Tex.	RA		6 h	
MP	Sallisaw, Okla.	RA			
NYC	Croton, N. Y.	AM	2		
	Weehawken, N. J.	RF	4	9 h	
	Buffalo, N. Y.	RA		6 h	
	Buffalo, N. Y.	CF			
	Rensselaer, N. Y.	RF	4	6 h	
	Rensselaer, N. Y.	RF	7	9 h	
	La Porte, Ind.	RF		6 h	

	Danbury, Conn.-Poughkeepsie, N. Y.	48	8	3 ssl	6	31 c	8 a
N&W	Bedford-Montvale, Va.	10.8	2		8	6 c	2 a
	Fort Lewis-Whitethorne, Va.	36.2	6		6	20 c	13 a
	Norcross, Va.-Bluefield, W. Va.	32.7	15		8	26 c	21 a
	Lubeck-Chillicothe, O.	3.7	3		18	6c	
	Pelton-Walton, Va.	7			1		1 a
	Eggleston-Pembroke, Va.	5.5	1			3 c	
NP	Wadena-Perham, Minn. (ABS)	20					21 a
PRR	Petersburg-Baree, Pa.	3.9					1 a
	W. Mifflin-Mifflin, Pa.	3.6				2 c	2 a
	Baltimore, Md.	1.1	1			3 c	1 a
	Indianapolis-Lebanon, Ind.	24.7	7		1	21 c	8 a
ONS&L			2		1	4 c	
SAL					1		
StL-SW					4		
SOO	Minneapolis-Buffalo, Minn.	37	11		17	26 c	11 a
SP	Lafayette, La. (ABS)	0.4					2 a
	Hearne-Tatsie, Tex. (ABS)	3.4					2 a
	Roseville-Lincoln, Calif.	9.8	2			10 c	6 a
	Eugene, Ore.	0.4	2		1	4 c	
	Mission Jct.-Aurant, Calif.	3	2			3 c	1 a
WABASH	Hardin-Camden, Mo.	13			5		4 a
WM	Baltimore-Hagerstown, Md. (ABS)	87					8 a

Totals	CTC road miles	1,744.4	Power-452	Auto. train stop 234	1,167 c	1,134 a
	CTC track miles	1,940.5	Spring-55	Elec. locks 523		(806 CTC)
	ABS road miles	109.7	SS with	(501 CTC)		(328 ABS)
	ABS track miles	175.7	FP lock-11	(10 ABS)		
				(12 other)		

(ABS) = automatic block signals
ss = spring switch
ssl = spring switch with facing point lock

ats = automatic train stop
c = controlled signal
a = automatic signal

Spring Switches Installed: 1961

Railroad	Switches	Signals
ACL	1 fpl	—
B&O	6	6
B&M	4	5
CNR	2	3
CPR	2 fpl	2
C&O	2	2
C&NW	6 fpl	—
MP	2 fpl	—
MONON	1	1
NYC	2	5
	1 fpl	
StL-SF	1	1
SAL	1 fpl	2
SOU	4	6
SP	13	7
	4 fpl	
T&P	1	—
Total Spring Switches	53	40
with F. P. Lock	17	

Slide Fence: 1961

	feet
CNR	4,450
D&RGW	5,600
GN	685
L&N	225
N&W	1,450
NP	495
P&WV	200
SP&S	1,650
UP	1,200
WP	506
	16,461

	Gravville, Ill.	RA		4 h	
	Chappell, Ill.	NF	5	5 h	1 d
NYC&StL	Ridge Farm, Ill.	RA			
NYCTA	BMT-B'way 57th St.	RF		7 h	4 d
	BMT-B'way 34th St.	CF		3 h	2 d
	BMT-B'way City Hall	CP		7 h	5 d
	BMT-B'way Whitehall	RF	3	4 h	3 d
	BMT-CI Term.	RM	6	5 h	
	IRT-Lex. Grand Central	CP	11	8 h	9 d
	IRT-Lex. Brooklyn Brdg.	CF	8	8 h	8 d
	IRT-Lex. 86th St.	RP	4	4 h	6 d
	IRT-Seventh 225th St.	RM		6 h	
	IRT-Brooklyn Flatbush Ave.	RA	4	4 h	
N&W	Williamson, W. Va.	NF	4	8 h	
PRR	Aspinwall, Pa.	AM	1	3 h	1 d
	Englewood, Ill.	AM	6		
RDG	Birdsboro, Pa.	RF			
	Philadelphia, Pa.	RF	6		
	Perkasie, Pa.	RF			
	Elsmere, Del.	RF			
	Monocasy, Pa.	NF	1	3 h	
StL-SF	Holdenville, Okla.	RA			
	Birmingham, Ala.	AM	6	3 h	
	Demopolis, Ala. (bridge)	RA			
SOO	Chippewa Falls, Wis.	RA			
SOU	E. Durham, N. C.	RA		6 h	
	Hattiesburg, Miss.	NA	1	6 h	1 d
SP	Houston, Tex.	RA		5 h	
	Tracy, Calif.	NF	1	3 h	
TRRStL	E. St. Louis, Ill.	RP	40	70 h	
	St. Louis	RF	1	3 h	
UP	Bonner Springs, Kan.	RF		6 h	
WAB	Hannibal, Mo.	NA		2 h	1 d
	Springfield, Ill.	RA		2 h	
	Oakwood, Mich.	NF		4 h	
	Totals		275	510 h	94 d

Type:
A = Addition
C = Consolidated
N = New
R = Rebuilt

A = Automatic
F = Free Lever
M = Mechanical
P = Pushbutton (route)

h = home signals
d = distant (approach) signals

Dragging Equipment Detectors: 1961

AT&SF	2
CB&Q	9
GN	4
PRR	1
SOU	21
	37

Broken Flange Detectors: 1961

CB&Q	3
PRR	1
SOU	11
	15

Communications Facilities: 1961

Summary of Communications Installed, 1959–61

	1959	1960	1961
Miles of new or rebuilt pole line	4,574	4,092	**6,350**
Miles of new aluminum line wire	2,568	4,307	**4,947**
Miles of new copper line wire	5,727	4,463	**3,718**
Carrier equipment installed			
Terminals—Voice only	1,169	1,589	**1,383**
Speech plus telegraph	103	197	**148**
Telegraph only	968	1,100	**1,517**
Repeaters—Voice only	121	130	**78**
Speech plus telegraph	4	6	—
Telegraph only	7	8	**22**
Printing Telegraph equipment			
SO, RO, and SR machines	421	725	**437**
Reperforators	104	240	**289**
Automatic telephone exchanges	38	28	**42**
Stations available	3,050	5,585	**1,040**
Train Radio			
Mobile	2,090	2,803	**1,367**
Road base stations	129	452	**214**
Yard base stations	104	131	**51**
Walkie-talkies	905	1,525	**463**
Yard loudspeaker systems			
Talk-back speakers	726	677	**690**
Paging speakers	346	296	**332**
Intercom systems			
Telephones	72	131	**66**
Loudspeakers	619	326	**409**
Totals	10,976	15,949	**8,548**

Intercom Systems Installed in 1961

Railroad	and Facility	Speakers	and Phones
AT&SF	at 3 yards	23 tb	8 p
	at 2 frt hs	72 s	
	at 2 ofcs	11 s	
	at 1 shop		1 t
ACL	at 2 frt hs	57 s	
	at 2 ofcs	48 s	
B&O	at 2 ofcs	73 s	
BAR	at 1 shop	30 s	14 t
CNR	at 5 yards	307 tb	201 p
	at 2 yards	6 s	8 t
	at 1 shop	30 s	14 t
CPR	at 1 yard	3 tb	
C&O	at 4 yards	70 tb	3 p
CB&Q	at 1 frt hs	9 s	
	at 2 shops	9 s	
CMStP&P	at 3 yards	37 tb	7 p
	at 1 frt hs	4 s	
CSS&SB	at 1 ofc		14 t
CTA	at 1 yard	6tb	
Clinchfield	at 1 shop	12 s	
EJ&E	at 2 yards	2 tb	1 p
E-L	at 3 yards	27 tb	
GN	at 2 yards		17 p
LS&I	at 1 yard	1 tb	
L&HR	at 1 yard		3 p
LI	at 4 stations	19 s	
L&N	at 1 yard	35 tb	20 p
MP	at 2 yards	21 tb	8 p
NYC	at 6 yards	107 tb	24 p
	at 1 frt hs	19 s	9 t
	at 1 ofc	6 s	
N&W	at 1 yard		6 p
PRR	at 2 yards	14 tb	7 p
	at 1 shop	2 s	
StL-SF	at 2 yards	1 tb	4 p
SOU	at 2 shops		6 t
	at 1 frt hs	2 s	
SP	at 2 yards	35 tb	23 p
WAB	at 1 yard	1 tb	

tb = talk-back speakers, 690
p = paging speakers, 332
s = intercom speakers, 409
t = intercom telephones, 66

Pole Line Construction Activity During 1961 on U. S. and Canadian Railroads

Railroad	Miles of New or Rebuilt Pole Line	Miles of New Wire Installed
AC&HB	40	
AT&SF	48	
ACL	358	
B&O	381	
BAR	46	
B&M	35	
CNR	883	96 ba, 4,451 ia 271 bhd, 4 ihd
CPR	200	1,370 bhd, 142 ACSR
C&O	288	2 bhd, 5*
C&NW	250	350 bcs, 50 ics
CB&Q	139	
CMStP&P	275	100 ics
CRI&P	130	
D&H	10	
DM&IR	13	21 ics
E-L	9	12 bhd
GN	—	866 ics
IC	14	258 ia
KCS	69	
LI	50	13 bhd
L&N	450	500 bhd
MP	603	
MONON	61	
NYC	2	
NYC&StL	112	
NP	215	
PRR	191	32 bhd 54 ics
QNS&L	160	
RDG	26	
StL-SF	176	
SAL	339	61 ihd
SOU	73	12 bhd
SP	577	
UP	10	
WAB	37	
WM	20	
WP	60	
	6,350	8,665

ba = bare aluminum	96 miles
ia = insulated aluminum	4,709 miles
ACSR	142 miles
Total aluminum wire	4,947 miles

bhd = bare hard drawn copper	2,212 miles
ihd = insulated hard drawn copper	65 miles
bcs = bare copper-covered steel	350 miles
ics = insulated copper-covered steel	1,091 miles
Total copper wire	3,718 miles

* 6 and 11 pair #19 rural distribution wire.

Equipment Installed on U. S. and Canadian Railroads in 1961

	Carrier Terminals	Carrier Repeaters	Printing Telegraph	
A	4 t		4 T	
	19 v, 30 t	11 v	2 T	2 R
lephone exch., 100 lines)				
crowave stations installed)				
	12 v	1 v	11 T	11 R
	2 v, 10 s, 11 t	—	37 T	32 R
lephone exchs., 77 lines total)				
	6 v			
	342 v, 504 MWv	—	228 T	148 R
	726 t, 170 MWt	—	—	—
lephone exchs., 375 lines total)				
icrowave stations installed)				
	62 v, 273 t	15 v, 22 t	—	—
elephone exchs., 55 lines total)				
crowave stations installed jointly with CNR)				
	8 v, 32 s, 76 t	2 v	—	—
	26 v, 8 s	4 v	—	—
	24 v	18 v	1 T	—
P	14 v, 34 s, 24 t	3 v	15 T	22 R
	4 v, 6 s	2 v	5 T	11 R
	24 v, 14 t	—	29 T	
icrowave stations installed)				
	10 v	—	—	
	6 v, 2 s	1 v	8 T	6 R
	12 v, 2 s	3 v	5 T	13 R
phone exchs., 83 lines total)				
	6 v	—	—	—
	6 v, 6 s	—	—	—
	8 v, 2 t	—	37 T	18 R
phone exchs., 150 lines total)				
	6 v, 4 MWv	3 MWv	—	—
crowave stations installed)				
	20 s	—	12 T	4 R
	6 v	—	—	—
	36 v, 4 s	3 v	5 T	3 R
	1 t	—	—	—
	22 v, 2 s	—	4 T	
	2 v, 2 s	1 v	3 T	
	24 MWv	—	—	—
crowave stations installed)				
	41 v, 1 s, 14 t	9 v	9 T	1 R
(1 telephone exch., 200 lines total)				
	90 v, 12 t	—	4 T	—
icrowave stations installed)				
2 microwave stations installed)				
	2 v	—	—	—
	2 s, 2 t	—	1 T	2 R
	—	—	2 T	10 R
	6 v, 6 s, 8 t	—	—	—
	39 v, 9 s	1 v	4 T	1 R
	2 t	—	4 T	1 R
	2 s	—	3 T	4 R
	2 v	—	4 T	—
	8 v	1 v	—	—
	2,900	100	437 T	289 R

= voice only
= speech plus telegraph
= telegraph only
= microwave

T = teletypewriter machines, SO, RO and SR
R = reperforators

voice terminals
s + t terminals
telegraph terminals
MW voice terminals
MW telegraph terminals
MW voice repeaters
voice repeaters
telegraph repeaters

386 teletypewriters RR owned
51 teletypewriters leased
274 reperforators RR owned
15 reperforators leased
42 telephone exchanges (37 RR owned) with 1,040 available lines (705 in RR owned exchs.)
108 microwave stations

(Continued from page 12)

year. Public approval of the first bond issue for the Bay Area Rapid Transit District's San Francisco subway and elevated system is expected this year. BARTD plans to install a completely automatic passenger transit system with crewless trains.

As for the signaling outlook for this year, one signal officer summed it up this way: "I expect 1962 to be a better year than last. We have plenty of signaling to install and we've got the money to do the job."

Forty-three U.S. and Canadian railroads have budgeted $31,175,370 (about 20% more than in 1961) for additions and betterments to their communications facilities during 1962. Top items on the '62 shopping list are microwave and railroad radio. According to the latest information received in a *Railway Signaling and Communications* survey, spending in 1962 compared to last year shapes up this way: 19 railroads plan to spend more money for communications in 1962. Their capital budgets total $15,282,800. The 18 roads planning to spend the same as last year indicated budget figures totaling $14,607,170. Those 15 roads planning to spend less in 1962 than in 1961, listed a total of $1,285,400 for capital expenditures.

Bulk handling of data receives top attention on six roads that plan to install microwave systems. While two roads give no mileage figures, four others report an intent to install 1,740 mile of microwave. The prime function, the roads report, is to handle data transmission and increase their direct distance dialing systems for better telephone service. While only 10 railroads stated specifically that they would add carrier equipment to their existing data and telephone systems, the majority of the 49 roads reporting indicated that general expansions would be made to their communications plants.

Interest in this bulk communications area was indicated by American Telephone & Telegraph Co., which introduced its Telpak tariff hoping to compete with private microwave systems. In recent testimony at the Federal Communications Commission's investigation of the Telpak tariff, AT&T Vice-President John J. Scanlon made these comments as to the question of a realistic choice between common carrier [telephone company] service and a private microwave system:

"It must be observed that Telpak is a common carrier service offering, with uniform rates for all. As such, it can't parallel in all respects the features of a privately provided micro-

(Please turn to page 18)

Train & Yard Radio Installed During 1961

Railroad	Mobile	Base	Walkie-talkie
ALASKA	1 MW	9 R	15
A&S	1 A	—	—
AT&SF	171 L, 25 C, 31 MW, 44 A	30 R, 2 Y	78
ACL	24 C, 4 A	3 R, 3 Y	36
B&O	8 L, 3 MW	2 R, 1 Y	14
B&M	4 L, 7 MW, 2 A, 5 T	7 R, 2 Y	2
CNR	20 L	3 R	—
CPR	32 L, 5 A		—
CofGa	6 MW, 1 A	1 R	—
CNJ	11 L, 2 MW, 2 A	3 R	—
C&O	—	1 R	—
C&IM	2 L, 7 C	—	2
C&NW	68 L, 25 C	3 Y	27
C&WI	—	—	2
CB&Q	88 L, 15 C	—	5
CMStP&P	10 A	1 Y	—
CR I&P	5 L	4 R	—
CSS&SB	2 A	—	—
CTA	2 L, 30 L*	1 R*	—
Clinchfield	8 MW, 8 T	—	—
D&RGW	4 L, 28 C, 6 A	1 R	—
DM&IR	3 MW, 1 A	1 R	—
E J&E	8 L, 3 A, 17 T	4 Y	34
E-L	4 L, 23 MW	2 R	—
FEC	10 A	17 R	—
G&F	11 L, 4 C	13 R	10
GN	14 C, 2 MW, 3 A	5 R	10
GB&W	2 A	—	—
GM&O	1 L	3 R	6
IC	3 A	—	4
IT	2 L	—	—
KCS	—	2 R	—
KO&G	1 MW	—	—
LS&I	2 A	—	—
L&N	8 L, 1 A	3 Y	15
MKT	7 L, 11 C	3 R	—
NYC	24 L, 17 C, 5 MW, 4 A	5 R, 8 Y	129
P&LE	40 L	2 R	—
N&W	—	3 Y	17
NP	43 L, 6 C, 1 A	8 R	4
PRR	15 L, 3 A	6 R, 4 Y, 1 R*	12
RDG	2 MW, 3 A	2 R	—
StL-SF	5 A	3 Y	8
SAL	50 L, 5 A	31 R	—
SOU	1 A	18 R, 3 Y	3
SP	14 L, 5 C, 85 MW 69 A, 48 T	26 R, 4 Y	15
SPS	5 C	—	—
T&P	—	2 R	—
UNION	35 L	5 Y	7
UP	11 A	2 Y	8
WM	10 L, 1 A	—	—
WP	2 A	2 R	—
Totals	1,367	265	463

* Inductive carrier.
L = Locomotives, 687 space radio, 30 inductive carrier
C = Cabooses, 186
MW = Maintenance of way equipment, 179
A = Automobiles, 207
T = Trucks, 78
R = Road base stations, 212 space radio, 2 inductive carrier
Y = Yard base stations, 51

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wave system. The latter essentially represents the provision of physical facilities with which generally comparable communications functions may be performed.

"The cost of private microwave systems turns heavily on the circumstances of each individual user's needs. The choice by an individual user as between Telpak and a privately provided system is likely to turn, therefore, on his individual appraisal of a great many considerations.

"But as far as cost alone is concerned, however, it is obvious that since the common carrier offering must be designed to meet average conditions, there will be an economic bias in favor of private microwave in those instances where conditions of terrain, the availability of customer-owned buildings for antenna sites, the possibility of employing existing personnel for the operation of a private system, etc., tend to make the private system appear the less costly."

Railroad radio receives prime attention from several roads faced with the Federal Communications Commission's November 1, 1963, deadline for operation of split-channel or narrow band radio. Several of the 21 roads reporting, said that major radio replacement programs are budgeted for this year. While radio equipment purchased during the last three to five years will operate on the narrow band required by the FCC or can easily be converted, many railroads have older equipment which cannot be converted. All radios that can't be converted must be replaced with new narrow band equipment. Several roads must replace multi-hundreds of radios before the FCC's 1963 deadline. At this early date, the survey results show only 277 radio purchases in 1962 budgets.

Survey returns covering other communications facilities such as pole lines, telephone exchanges and loudspeaker systems are too sketchy to be of much value. However, most reporting roads indicated that pole line reconstruction would continue at about previous levels of activity. A few railroads reported cable plant replacements, but no specific information was presented.

Most replies indicated that budgeted items would be fulfilled. One communications officer said: "We'll be busier than ever in the coming year." Another reported that a significant rise in carloadings on his road would "let us cut down the backlog of budget items that have fallen under the 1962 economy axe." One man expressed the opinion that the reduction in capital expenditures on his road would enable him to work off some deferred maintenance, especially on his pole lines. RS