

**NUMERICAL INDEX — DIVISION 420
MICROWAVE RADIO — COMMON EQUIPMENT**

1. GENERAL

- 1.01** This section provides an index of System-issued sections in Division 420.
- 1.02** This section reverted to Issue 1 in January 1981. Prior to that date there had been 99 issues of the section.
- 1.03** A bullet (●) indicates an item that has been added or changed since the previous issue of the index.
- 1.04** A square (□) indicates a canceled item. Information relating to the cancellation, if necessary, will be shown in a note following the item. Canceled items and related notes will be deleted upon reissue of the index.
- 1.04** A club (♣) indicates a section that refers to a Manufacturer's Manual — providing a number for filing purposes and instructions for ordering the manual.
- 1.06** A spade (♠) indicates an item not on microfiche. This index indicates the latest issue for hard-copy BSPs. In some cases, the microfiche BSP will reflect the next higher issue as a result of the reduced distribution interval.
- 1.07** "Add" is the abbreviation for Addendum, and "Sup" is the abbreviation for Supplement.

Section Number	Issue	Subject
420-210-502	4	IF and Oscillator Rest Frequencies
420-210-503	2	Square-Wave Response
420-210-504	2	IF Output and Frequency Response
420-210-505	2	Linearity
Add 420-210-506	1	
420-210-506	2	Deviation Sensitivity
420-210-507	2	Frequency Response and Monitor Gain Adjustments
420-210-508	2	Alarm Circuit Adjustments
420-210-509	1	Fluctuation Noise and Spurious Tone Measurements
420-210-510	1	Oven Temperature Control Circuit — Performance Checks
420-210-511	1	Control Unit — Performance Checks
420-210-512	1	-20 Volt Regulator — Performance Checks

2. LAYERS

2.01 This division is arranged in layers as follows:

- 420-0 Index and Equipment Test List
 - 2 FM Terminals
 - 3 Auxiliary Systems
 - 5 Portable Microwave Repeater
 - 6 Switching
 - 7 Maintenance Center
 - 8 Ancillary Equipment

420-211 3A FM Receiver

Description

420-211-100	1	Description
420-211-301	1	Placement In and Removal From Service

Tests

420-211-500	2	General
420-211-501	1	In-Service Checks
420-211-502	1	Square-Wave Response
Add 420-211-503	1	
420-211-503	2	Gain, Frequency Response, Limiting Action, and Alarm Circuit Adjustments

3. INDEX

Section Number	Issue	Subject
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420-0 INDEX AND EQUIPMENT TEST LIST

- ♣ 420-000-000 15 Numerical Index — Division 402 — Microwave Radio — Common Equipment
- 420-001-011 9 ETL — Microwave Radio — Common Equipment

420-2 FM TERMINALS

420-210 3A FM Transmitter

Description

Add 420-210-100	1	
420-210-100	1	Description
420-210-301	1	Placement In and Removal From Service

Tests

420-210-500	2	General
420-210-501	2	In-Service Checks

420-213 4-Type FM Terminals

420-213-500	2	Description and Maintenance — J68418C Portable Housing
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NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

SECTION 420-000-000

Section Number	Issue	Subject
420-214 4-Type FM Transmitter		
Description		
Add 420-214-100	1	
420-214-100	2	Description
420-214-301	3	Placement In and Removal From Service
Tests		
420-214-500	2	General
420-214-501	3	In-Service Checks
Add 420-214-502	1	
420-214-502	3	Rest Frequency, Output Level, and Deviation Sensitivity
420-214-503	3	IF Flatness, Linearity, and Delay
420-214-504	3	Tests—Baseband Gain-Frequency Response
420-214-505	3	Fluctuation Noise and Spurious Tone Measurements
420-214-506	3	Square-Wave Response
420-215 4-Type FM Receiver		
420-215-100	2	Description
420-215-301	2	Placement In and Removal From Service
Tests		
420-215-500	3	General
420-215-501	2	In-Service Checks
420-215-502	4	FM Terminal — Square-Wave Response Test
420-215-503	3	Gain, Frequency Response, and Limiting Action
420-215-504	4	Linearity
420-215-505	4	Fluctuation Noise and Spurious Tone Measurements
420-216 5A FM Terminal BB Modem		
420-216-100	1	Description
420-216-301	1	Placement In and Removal From Service
420-216-500	1	Tests — General
420-216-501	2	In-Service Tests
420-216-502	1	J68418F — Rest Frequency, Output Level, and Deviation Sensitivity
Add 420-216-503	1	
420-216-503	1	J68418F — Transmitter — IF Flatness, Linearity, and Delay
420-216-504	1	J68418F — Receiver Linearity and Delay
420-216-505	2	Gain, Frequency Response, and Limiting Action

Section Number	Issue	Subject
420-216-506	2	Fluctuation Noise and Spurious Tone Measurements
420-216-507	1	Square-Wave Response
420-216-508	1	Pilot Detector Tests
420-216-509	1	J68418F — Linearity and Delay Tests
420-217 5A FM Terminal IF Deviation Shifter		
420-217-100	1	Description
420-217-301	1	Placement In and Removal From Service
420-217-500	1	Test — General
420-217-501	1	In-Service Tests
420-217-502	1	J68418G — Output Level, Rest Frequency, and Deviation Sensitivity
Add 420-217-503	1	
420-217-503	1	J68418G — IF Deviation Shifter — Transmitter — IF Flatness, Linearity, and Delay
420-217-504	1	J68418G — IF Deviation Shifter — Receiver Linearity and Delay
420-217-505	2	Gain, Frequency Response, and Limiting Action
420-217-506	2	Fluctuation Noise and Spurious Tone Measurements
420-217-507	1	Square-Wave Response
420-217-508	2	J68418G — IF Deviation Shifter — Baseband Protection Circuit

420-3 AUXILIARY SYSTEMS

420-300) J68422 Frequency Diplexed Auxiliary Channel 420-304)

Description

420-300-100	1	Overall System
420-300-101	1	J68422C Modulating/Demodulating Panel
420-300-102	1	J68422E — 19 Volt Regulator, 263A Amplifier, and 1030A Filter Panel
420-300-103	1	16A Modulator
420-300-104	1	Farinon Multiplex Service Channel
420-300-106	2	Auxiliary Channel Switching

Tests

420-300-500	1	General Test Information and Level Diagrams
420-300-501	2	Service Channel Tests — Terminals
420-300-502	1	Service Channel Tests — Repeaters

Section Number	Issue	Subject	Section Number	Issue	Subject
420-301 Auxiliary Channel Switching System			420-610-104	3	J68381BG/DN/EF Channel Initiators
Operation			420-610-105	3	J68381BH/DM/DY/EB/FG Protection Pilot Detectors
420-301-300	1	Operation	420-610-106	1	General Logic Circuits
Tests			Add 420-610-107	2	
420-301-500	1	General	420-610-107	1	Receiving Logic
420-301-501	2	Terminal Station	Add 420-610-108	1	
420-301-502	1	Repeater Station	420-610-108	1	Transmitting Logic
420-302 J68422C Auxiliary Channel Modulating/Demodulating Panel			420-610-109	1	Auxiliary Station Logic
Tests			Add 420-610-110	1	
420-302-500	1	Maintenance	420-610-110	1	Voice Frequency Circuits
420-304 16A Modulator			420-610-111	2	Controls, Indications, and Alarms
420-304-500	1	Removal and Replacement	Add 420-610-112	1	
420-305 IF Entrance Link			420-610-112	1	J68381E Exerciser
420-305-000	2	Description, Operation, and Maintenance	420-610-113	1	Power
420-306 J68415A Heterodyne Auxiliary Channel			420-610-114	1	DC Translator
420-306-100	2	Description	420-610-115	2	J68381DJ IF Amplifier-Limiter Circuit and J68381EH IF Amplifier With Squelch
Add 420-306-500	1		420-610-116	1	J68389AC IF Amplifier
420-306-500	2	Tests	420-610-120	1	Simplified 1X1 System
420-307 Radio Protection Monitor			420-610-121	1	Combined System
420-307-101	1	J68455A-1 100A — Description, Operation, and Maintenance	420-610-122	1	Split System
420-5 PORTABLE MICROWAVE REPEATER			420-610-125	1	100A/400A Overbuild System
✚ 420-501-100	1	Farinon (PMR4000) — Description, Operation, and Maintenance	Operation		
✚ 420-502-100	1	Hewlett-Packard 4 GHz (83001A) — Description, Operation, and Maintenance	420-610-300	5	System Operation
420-6 SWITCHING			420-610-302	1	Description, Operation, and Maintenance — Register Circuits
420-600 Data Tests			System Tests		
420-600-302	1	Protection Switching Systems — Registers — Recording and Analysis	420-610-500	1	General
420-600-501	2	Long-Haul Radio System Data Trouble — Location Tests for 1A Radio Digital System (1A RDS)	420-610-502	8	J68381B Receiving IF Switch Bay
420-610 100A Protection Switching System			420-610-503	3	J68381C Receiving Control Bay
Description			420-610-504	4	J68381A Transmitting IF Switch and Control Bay
420-610-100	4	Overall System	420-610-505	2	J68381D Auxiliary Station IF Switch and Control Bay
420-610-101	2	IF Switches	420-610-506	4	Overall System
420-610-102	2	J68381BK and J68381EG IF Amplifiers	420-610-507	3	J68389A IF Equalization and Amplifier Bay
420-610-103	3	J68381BT/DP/DW/EA Protection Carrier Supplies	420-610-510	2	1 X 1 Simplified Switching System
			420-610-511	3	1X11 — J68381B Receiving IF Switch Bay
			420-610-512	2	1X11 — J68381C Receiving Control Bay

SECTION 420-000-000

Section Number	Issue	Subject
Add 420-610-513	1	
420-610-513	1	1X11 — J68381A Transmitting IF Switch and Control Bay
420-610-515	2	1 X 11 — Overall System
420-610-516	1	1X11 J68389A IF Equalization and Amplifier Bay

420-611 IF Equipment Tests

420-611-500	1	General
Add 420-611-501	1	
420-611-501	3	J68381BK, J68381EG, and J68389AC IF Amplifiers
420-611-502	2	J68381BJ/EJ IF Switch Control Unit
• 420-611-503	3	J68381BH/DM/DY/EB/FG Protection Pilot Detector Circuit
420-611-504	4	J68381BT/DP/DW/EA Protection Carrier Supply
420-611-505	2	8A, 8B, and 14A Gates
Add 420-611-506	1	
420-611-506	3	J68381DJ IF Amplifier-Limiter Circuit and J68381EH IF Amplifier With Squelch

420-612 Initiator Tests

420-612-501 3 J68381DN/BG/EF Channel Initiator

420-613 Receiving Logic Plug-in Units

420-613-500	2	General
Add 420-613-501	1	
420-613-501	1	Tests

420-614 Transmitting Logic Plug-in Units

420-614-500	2	General
420-614-501	1	Tests

420-615 Auxiliary Station Logic Plug-in Units

420-615-500	1	General
420-615-501	1	Tests

420-616 Voice-Frequency Circuit Plug-in Units

420-616-500	1	General
420-616-501	1	Tests

420-617 J68381E Exerciser Logic Plug-in Units

420-617-500	2	General
420-617-501	2	Tests

420-618 Miscellaneous Equipment

420-618-500	1	General
420-618-501	2	Tests

Section Number Issue Subject
420-620 400A Protection Switching System

Description

420-620-100	2	Overall System
420-620-101	2	Basic System
420-620-102	1	100A/400A Overbuild System
420-620-103	1	IF Intermix
420-620-104	1	Manual Controls, Indications, and Alarms
420-620-106	1	J68429P IF Amplifier
420-620-107	2	J68429S Protection Carrier Supply
420-620-108	2	J68429K/L Channel Initiators
420-620-109	1	J68429R IF Level Detector
420-620-110	1	295-Type Switches
420-620-115	1	General Logic Circuits
420-620-116	3	Receiving Logic — Description
420-620-117	1	J68429F Receiving Channel Control Circuit
420-620-118	1	J68429G Receiving Protection Channel Control Circuit
420-620-119	1	J68429H Receiving Access Protection Switch Control Circuit
420-620-120	1	Description, Operation, and Maintenance — Simplified 1 X 1 System
420-620-125	1	VF Control Signaling Facilities
420-620-126	1	ED-51903 VF Tone Oscillator and Logic
420-620-127	1	ED-51904 VF Summing Amplifier
420-620-128	1	ED-51905 VF Order-Tone Detector and Logic Unit
420-620-129	1	ED-51906 VF Continuity Tone Detector and Logic Circuit
420-620-130	1	ED-51926 VF Guard Tone, Noise Detector and Logic Circuit
420-620-131	1	ED-51927 VF AGC Amplifier
420-620-135	2	Transmitting Logic Circuits — Description
420-620-136	1	J68429M Transmitting Regular Channel Control Circuit
420-620-137	1	J68429N Transmitting Protection Channel Control Circuit
420-620-138	1	J68429J Transmitting Access Protection — Switch Control Circuit
420-620-140	1	100A/400A Overbuild Circuits
420-620-141	1	400A Add-Drop System — Description, Operation and Maintenance

Section Number	Issue	Subject	Section Number	Issue	Subject
420-620-145	1	ED-51900 (ATI), ED-51901 (IDI), and ED-51902 (RDI) Relay Units	420-630-106	3	Sensor Circuits
420-620-146	1	J68429T Remote Key and Lamp Panel	420-630-107	2	Monitoring and Test Facilities
420-620-147	1	Description, Operation, and Maintenance — Register Circuits	420-630-108	2	Power and Power Distribution
420-620-150	1	J68429W Exerciser	420-630-109	2	J68389AA IF Amplifier
420-620-155	2	Power	Operation		
420-620-300	2	System Operation	420-630-300	5	Operation — Overall System
420-620-301	1	Putting Into Service	Tests		
420-620-302	1	Transmitting IF Switch and Control Bay — Performance Requirements	420-630-500	7	Tests — Overall System
420-620-303	2	Receiving IF Switch and Control Bay — Performance Requirements	420-630-501	2	FM Terminal Transmitter and Wire-Line Entrance Link Switching Tests — Automatic and Manual Control Circuits
420-620-304	2	Supplementary IF Switch and Control Bay — Performance Requirements	420-630-502	2	FM Terminal Receiver and Wire-Line Entrance Link Switching Tests — Automatic and Manual Control Circuits
420-620-305	2	J68429D IF Switch and Control Bay — Performance Requirements	420-630-503	5	J68381BK, J68381EG, J68389AA, and J68389AC IF Amplifiers
Tests			420-630-504	3	J68382H FM Receiver
420-620-500	2	General	420-630-505	6	Tests — J68382E Baseband Amplifier-Rectifier
420-620-501	5	Overall System	420-630-506	3	J68398P Metering Circuit
420-620-502	4	J68429A Transmitting IF Switch and Control Bay—System Tests	420-630-507	2	J87252C Voltage Regulator
420-620-503	7	J68429B Receiving IF Switch and Control Bay	420-650 300A Protection Switching System		
420-620-504	6	J68429C Supplementary IF Switch and Control Bay	420-650-100	3	Description
420-626-500	2	Troubleshooting—System Tests	420-650-300	2	Operation
420-628-000	1	401A — Description, Operation, and Maintenance	420-650-500	2	System Tests — General
420-629-000	1	401C — Description, Operation, and Maintenance	420-650-501	2	System Tests — Transmitting End
420-630 200A Protection Switching System			420-650-502	3	System Tests — Receiving End
Description			420-660 400B Protection Switching System		
420-630-100	4	Overall System	420-660-100	1	Description
420-630-101	5	FM Terminal Transmitter and Wire-Line Entrance Link Switching	420-660-101	1	Manual Controls, Indications, and Alarms
420-630-102	5	Description — FM Terminal Receiver and Wire-Line Entrance Link Switching	420-660-102	1	Baseband Transmission
420-630-103	4	FM Terminal Transmitter and WLEL Switching — Automatic and Manual Control Circuits	420-660-110	1	Overall System Logic
420-630-104	4	Description — FM Terminal Receiver and WLEL Switching — Automatic and Manual Control Circuits	420-660-111	1	Receiving Logic — Description
420-630-105	2	Indications, Alarms, and Alarm Circuits	420-660-112	1	J68437D Receiving Regular Channel Control Unit — Description
			420-660-113	1	J68437F Receiving Protection Channel Control Unit — Description
			420-660-115	2	VF Control Signaling Facility — Description
			420-660-116	1	VF Tone Oscillator and Logic Unit — Description
			420-660-117	1	VF Summing Amplifier — Description

SECTION 420-000-000

Section Number	Issue	Subject
420-660-118	1	VF Order-Tone Detector and Logic Unit — Description
420-660-119	1	Description — VF Continuity Tone Detector and Logic Circuit
420-660-120	1	VF Guard Tone, Noise Detector and Logic Circuit — Description
420-660-121	1	VF AGC Amplifier Description
420-660-125	1	Description — Transmitting Logic
420-660-126	1	J68437J Transmitting Regular Channel Control Unit — Description
420-660-127	1	J68437H Transmitting Protection Channel Control Unit — Description
420-660-130	1	ED-51900 (AT), ED-51901 (ID), and ED-51902 (RD) Relay Units — Description
420-660-131	1	J68437M Remote Key and Lamp Panel — Description
420-660-135	1	J68437L Exerciser Description
420-660-140	2	Digital Control Signaling Facility — Description
420-660-141	1	Encoding Units Description
420-660-142	1	Decoding Unit Description
420-660-143	1	ED-52173-30 Remote Manual Switch Control — Description
420-660-145	1	Power Circuits — Description
420-660-300	1	System Operation
420-660-301	1	Placing in Service
420-660-500	1	System Tests — General
420-660-501	1	System Tests — Overall System Routines
420-660-502	2	System Tests — J68437A Bay Tests
420-667-500	1	System Tests — Troubleshooting
420-670 401B Protection Switching System		
420-670-100	1	Description
420-670-101	1	Description — Manual Controls, Indications, and Alarms
420-670-110	1	Description — Logic Circuits
420-670-300	1	Operation
420-670-301	1	Putting Into Service
420-670-500	1	System Tests — General
420-670-501	1	System Tests — Overall System
420-671-500	1	System Tests — Troubleshooting

Section Number	Issue	Subject
420-680 400D Protection Switching System		
Description		
420-680-100	1	Description
420-680-101	1	Manual Controls, Indications, and Alarms
420-680-102	2	Signaling — Description
420-680-103	1	Description — Channel Control Circuits
420-680-110	1	Description — Switches
420-680-115	1	Description — Exerciser
420-680-120	1	Simplified 1X1 System
420-680-300	1	System Operation
420-684 400H Protection Switching System		
Description		
420-684-100	2	Overall System
420-684-101	2	Manual Controls, Indications, and Alarms
420-684-102	2	Signaling
420-684-106	1	Channel Control Circuits
420-684-110	1	Switches
420-684-120	1	Exerciser
420-684-130	1	Description, Operation and Maintenance — Simplified 1X1 System
420-684-300	2	System Operation
420-684-301	1	Placing Into Service
420-684-302	1	Performance Requirements
420-684-500	1	System Tests — General
420-684-501	1	System Tests — Overall System
420-684-502	1	System Tests — Troubleshooting
420-685 401H Protection Switching System		
420-685-000	1	Description, Operation, and Maintenance
420-7 MAINTENANCE CENTER		
420-700-500	1	3-Type FM Terminal — General
420-701 3-Type FM Terminal — J68381DL Amplifier-Limiter		
420-701-501	1	Return Loss
420-701-502	1	Gain, Gain Range, Limiter Action and IF Flatness at Normal and ± 2 dB Relative Gain
420-701-503	1	Troubleshooting

Section Number	Issue	Subject	Section Number	Issue	Subject
420-702	3-Type FM Terminal — J68383C or J68383P Deviator		420-707-502	1	Frequency Response, Gain, Limiter Action
Add 420-702-501	1		420-707-503	1	Troubleshooting
420-702-501	1	J68383C or J68383P Deviator	420-708	3-Type FM Terminal — J68383L Limiter-Amplifier	
420-703	3-Type FM Terminal — J68383D Control Unit		420-708-501	2	Return Loss
420-703-501	1	J68383D Control Unit	420-708-502	1	Frequency Response, Gain, Limiter Action
420-704	3-Type FM Terminal — J68383E IF Main Amplifier		420-708-503	1	Troubleshooting
420-704-501	1	J68383E IF Main Amplifier	420-709	3-Type FM Terminal — J68383J and J68383U Discriminator Baseband	
420-704-502	1	Troubleshooting	420-709-501	1	Return Loss
420-705	3-Type FM Terminal — J68383F Baseband Amplifier		420-709-502	1	IF Frequency Response
420-705-501	1	Bias Adjustment and Power Supply Noise Rejection	420-709-503	1	High- and Low-Frequency Tank Circuit Adjustment
420-705-502	1	Baseband Response and Gain Range	420-709-504	1	Discriminator Crossover and IF Trap Adjustment
420-705-503	1	Longitudinal Suppression	420-709-505	1	Baseband Gain Range
420-705-504	1	Square-Wave Response	420-709-506	1	Discriminator Linearity
420-705-505	2	Linearity	420-709-507	1	Noise
420-705-506	1	Noise Measurement	420-709-508	1	Baseband Response
420-705-507	1	Troubleshooting	420-709-509	1	Square-Wave Response
420-706	3-Type FM Terminal — J68383G Monitor Unit		420-709-510	1	Level Alarm
420-706-501	1	Return Loss	420-709-511	1	Troubleshooting
420-706-502	1	High- and Low-Frequency Tank Circuit Adjustments	420-710	3B FM Terminal — J68383S Control Unit	
420-706-503	1	DC Differential Balance and Discriminator Crossover Adjustments	420-710-501	1	Troubleshooting
420-706-504	2	IF Trap Adjustments	420-712	3-Type FM Terminal	
420-706-505	1	Discriminator Linearity Adjustment	420-712-501	1	J87252B — 20V Regulator
420-706-506	2	Baseband Gain Range and Frequency Response	420-8	ANCILLARY EQUIPMENT	
420-706-507	2	Square-Wave Response	420-801-100	1	J68389AD IF Amplifier — Description
420-706-508	1	Frequency Alarm	420-801-500	1	J68389AD IF Amplifier — Tests and Adjustments
420-706-509	1	Level Alarm	420-802-100	2	Microwave Radio — Common Equipment — 652A Integrated Circuit — RF Preamplicifier — Description, Installation, and Replacement
420-706-510	1	Troubleshooting	420-810-500	1	System Tests — J68389A IF Equalization and Amplifier Bay
420-707	3A FM Terminal — J68383H Limiter-Amplifier				
420-707-501	1	Return Loss			