

```
entry:
  %mem = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 1
  %0 = load %struct.jpeg_memory_mgr*, %struct.jpeg_memory_mgr** %mem, align 8,
    ... , tbaa 13
  %alloc_small = getelementptr inbounds %struct.jpeg_memory_mgr,
    ... , tbaa 13
  %1 = load i8* (%struct.jpeg_common_struct*, i32, i64)*, i8*
    ... (%struct.jpeg_common_struct*, i32, i64)** %alloc_small, align 8, tbaa 11
  %2 = bitcast %struct.jpeg_compress_struct* %cinfo to
    ... %struct.jpeg_common_struct*
  %call = tail call i8* %1(%struct.jpeg_common_struct* %2, i32 1, i64 104) #5
  %downsampled1 = getelementptr inbounds %struct.jpeg_compress_struct,
    ... %struct.jpeg_compress_struct* %cinfo, i64 0, i32 57
  %3 = bitcast %struct.jpeg_downsampler** %downsampled1 to i8**
  store i8* %call, i8** %3, align 8, tbaa 114
  %start_pass2 = bitcast i8* %call to void (%struct.jpeg_compress_struct**)*
  store void (%struct.jpeg_compress_struct**)* %start_pass_downsample, void
    (%struct.jpeg_compress_struct**)* %start_pass2, align 8, tbaa 115
  %downsampled4 = getelementptr inbounds i8, i8* %call, i64 8
  %4 = bitcast i8* %downsampled4 to void (%struct.jpeg_compress_struct*, i8***,
    ... i32, i8***, i32)**
  store void (%struct.jpeg_compress_struct*, i8***, i32, i8***, i32)**
    %4, align 8, tbaa 118
  %need_context_rows = getelementptr inbounds i8, i8* %call, i64 16
  %5 = bitcast i8* %need_context_rows to i32*
  store i32 0, i32* %5, align 8, tbaa 119
  %CCIR601_sampling = getelementptr inbounds %struct.jpeg_compress_struct,
    ... %struct.jpeg_compress_struct* %cinfo, i64 0, i32 26
  %6 = load i32, i32* %CCIR601_sampling, align 4, tbaa 120
  %tobool = icmp eq i32 %6, 0
  br i1 %tobool, label %if.end, label %if.then, !prof 121
```

```
if.then:
  %crr = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 0
  %7 = load %struct.jpeg_error_mgr*, %struct.jpeg_error_mgr** %crr, align 8,
    ... , tbaa 122
  %msg_code5 = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %7, i64 0, i32 5
  store i32 23, i32* %msg_code5, align 8, tbaa 123
  %error_exit = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %7, i64 0, i32 0
  %8 = load void (%struct.jpeg_common_struct*)*, void
    (%struct.jpeg_common_struct**)* %error_exit, align 8, tbaa 125
  tail call void @5(%struct.jpeg_common_struct* %2) #5
  br label %if.end
```

```
if.end:
  %num_components = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 12
  %9 = load i32, i32* %num_components, align 4, tbaa 126
  %cmpl36 = icmp sgt i32 %9, 0
  br i1 %cmpl36, label %for.body.lr.ph, label %if.end84, !prof 127
```

```
for.body.lr.ph:
  %comp_info = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 14
  %10 = load %struct.jpeg_component_info*, %struct.jpeg_component_info**
    %comp_info, align 8, tbaa 128
  %max_h_samp_factor = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 58
  %smoothing_factor = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 27
  %methods = getelementptr inbounds i8, i8* %call, i64 24
  %11 = bitcast i8* %methods to [10 x void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)*]
  %err68 = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 0
  %12 = bitcast i32* %max_h_samp_factor to i64*
  br label %for.body
```

```
for.body:
  %13 = phi i32 [ %9, %for.body.lr.ph ], [ %27, %for.inc ]
  %indvars.iv = phi i64 [ 0, %for.body.lr.ph ], [ %indvars.iv.next, %for.inc ]
  %smoothok.0141 = phi i32 [ 1, %for.body.lr.ph ], [ %smoothok.1, %for.inc ]
  %comp_ptr.0139 = phi %struct.jpeg_component_info* [ %10, %for.body.lr.ph ], [
    ... %indec_ptr, %for.inc ]
  %h_samp_factor = getelementptr inbounds %struct.jpeg_component_info,
    ... %struct.jpeg_component_info* %comp_ptr.0139, i64 0, i32 2
  %14 = bitcast i32* %h_samp_factor to i64*
  %15 = load i64, i64* %14, align 8
  %16 = trunc i64 %15 to i32
  %17 = load i64, i64* %12, align 8
  %18 = trunc i64 %17 to i32
  %cmp7 = icmp eq i32 %16, %18
  %19 = lshr i64 %15, 32
  %20 = trunc i64 %19 to i32
  %21 = lshr i64 %17, 32
  %22 = trunc i64 %21 to i32
  %cmp8 = icmp eq i32 %20, %22
  %or.cond148 = and i1 %cmp7, %cmp8
  br i1 %or.cond148, label %if.then9, label %if.else18, !prof 129
```

```
if.else18:
  %mul = shl nsw i32 %16, 1
  %cmp21 = icmp eq i32 %mul, %18
  br i1 %cmp21, label %land.lhs.true22, label %if.else54, !prof 132
```

```
land.lhs.true22:
  %cmp25 = icmp eq i32 %20, %22
  br i1 %cmp25, label %if.then26, label %land.lhs.true35, !prof 133
```

```
land.lhs.true35:
  %mul37 = shl nsw i64 %19, 1
  %mul37 = trunc i64 %mul37 to i32
  %cmp39 = icmp eq i32 %mul37, %22
  br i1 %cmp39, label %if.then40, label %if.else54, !prof 132
```

```
if.then26:
  %arrayidx29 = getelementptr inbounds [10 x void
    (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*, i8**, i8**)*],
    [10 x void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)*] %11, i64 0, i64 %indvars.iv
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @h2v1_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx29, align 8, tbaa 131
  br label %for.inc
```

```
if.else54:
  %rem = sdiv i32 %18, %16
  %cmp57 = icmp eq i32 %rem, 0
  br i1 %cmp57, label %land.lhs.true58, label %if.else67
```

```
land.lhs.true58:
  %rem61 = sdiv i32 %22, %20
  %cmp62 = icmp eq i32 %rem61, 0
  br i1 %cmp62, label %if.then63, label %if.else67
```

```
if.else67:
  %25 = load %struct.jpeg_error_mgr*, %struct.jpeg_error_mgr** %err68, align
    8, tbaa 122
  %msg_code69 = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %25, i64 0, i32 5
  store i32 27, i32* %msg_code69, align 8, tbaa 123
  %error_exit1 = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %25, i64 0, i32 0
  %26 = load void (%struct.jpeg_common_struct*)*, void
    (%struct.jpeg_common_struct**)* %error_exit1, align 8, tbaa 125
  tail call void @26(%struct.jpeg_common_struct* %nomul) #2) #5
  %pre = load i32, i32* %num_components, align 4, tbaa 126
  br label %for.inc
```

```
if.else:
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @h2v2_smooth_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx, align 8, tbaa 131
  br label %for.inc
```

```
if.then1:
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @h2v2_smooth_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx, align 8, tbaa 131
  store i32 1, i32* %5, align 8, tbaa 119
  br label %for.inc
```

```
if.else49:
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @h2v2_smooth_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx46, align 8, tbaa 131
  br label %for.inc
```

```
if.then43:
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @h2v2_smooth_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx46, align 8, tbaa 131
  br label %for.inc
```

```
if.then63:
  %arrayidx66 = getelementptr inbounds [10 x void
    (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*, i8**, i8**)*],
    [10 x void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)*] %11, i64 0, i64 %indvars.iv
  store void (%struct.jpeg_compress_struct*, %struct.jpeg_component_info*,
    i8**, i8**)* @int_downsample, void (%struct.jpeg_compress_struct*,
    %struct.jpeg_component_info*, i8**, i8**)* %arrayidx66, align 8, tbaa 131
  br label %for.inc
```

```
for.inc:
  %27 = phi i32 [ %13, %if.then11 ], [ %13, %if.else ], [ %13, %if.then26 ], [
    ... %13, %if.then43 ], [ %13, %if.else49 ], [ %13, %if.then63 ], [ %pre,
    ... %if.else67 ]
  %smoothok.1 = phi i32 [ %smoothok.0141, %if.then11 ], [ %smoothok.0141,
    ... %if.else ], [ 0, %if.then26 ], [ %smoothok.0141, %if.then43 ], [
    ... %smoothok.0141, %if.else49 ], [ 0, %if.then63 ], [ %smoothok.0141, %if.else67
    ... ]
  %indvars.iv.next = add nsw nsw i64 %indvars.iv, 1
  %indec_ptr = getelementptr inbounds %struct.jpeg_component_info,
    ... %struct.jpeg_component_info* %comp_ptr.0139, i64 1
  %28 = sext i32 %27 to i64
  %cmp = icmp slt i64 %indvars.iv.next, %28
  br i1 %cmp, label %for.body, label %for.end, !prof 127
```

```
for.end:
  %smoothok.1.lesso = phi i32 [ %smoothok.1, %for.inc ],
  %29 = load i32, i32* %smoothing_factor, align 8, tbaa 130
  %tobool77 = icmp eq i32 %29, 0
  %tobool79 = icmp ne i32 %smoothok.1.lesso, 0
  %or.cond = or i1 %tobool79, %tobool77
  br i1 %or.cond, label %if.end84, label %if.then80, !prof 134
```

```
if.then80:
  %err81 = getelementptr inbounds %struct.jpeg_compress_struct,
    %struct.jpeg_compress_struct* %cinfo, i64 0, i32 0
  %30 = load %struct.jpeg_error_mgr*, %struct.jpeg_error_mgr** %err81, align
    8, tbaa 122
  %msg_code82 = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %30, i64 0, i32 5
  store i32 98, i32* %msg_code82, align 8, tbaa 123
  %emit_message = getelementptr inbounds %struct.jpeg_error_mgr,
    ... %struct.jpeg_error_mgr* %30, i64 0, i32 1
  %31 = load void (%struct.jpeg_common_struct*)*, void
    (%struct.jpeg_common_struct**)* %emit_message, align 8, tbaa 135
  tail call void @31(%struct.jpeg_common_struct* %nomul) #2) #5
  br label %if.end84
```

```
if.end84:
  ret void
```